

Archives
Y385
A195
15



THE CENTENNIAL OF
SURGICAL ANESTHESIA

AN ANNOTATED CATALOGUE

OCTOBER 1946



YALE
MEDICAL LIBRARY



HISTORICAL
LIBRARY

SURGICAL ANESTHESIA

Publication No. 15

HISTORICAL LIBRARY
YALE MEDICAL LIBRARY

OTHER PUBLICATIONS

*Issued Under the Auspices of the
Historical Library*

1. The Harvey Cushing Collection of Books and Manuscripts, 1943.
2. The Arnold C. Klebs Collection of Books and Manuscripts. (*In Preparation*)
3. The John F. Fulton Collection of Books and Manuscripts. (*In Preparation*)
4. *Bibliographia primatologica*. A Classified Bibliography of Primates other than Man. By T. C. RUCH, 1941.
5. A Bibliography of Aviation Medicine. By E. C. HOFF and J. F. FULTON, 1942.
6. A Bio-bibliography of Andreas Vesalius. By HARVEY CUSHING, 1943.
7. The Four Hundredth Anniversary Celebration of *De humani corporis fabrica* of Andreas Vesalius, 1943.
8. Malaria in Simian Primates: a Classified Bibliography with Annotations. By T. C. RUCH, 1944.
9. A Bibliography of Aviation Medicine: Supplement. By P. M. HOFF, E. C. HOFF, and J. F. FULTON, 1944.
10. A Visit to Le Puy-en-Velay: an Illustrated Diary [August 1900]. By HARVEY CUSHING, 1944.
11. A Bibliography of Visual Literature, 1939-1944. Compiled by J. F. FULTON, P. M. HOFF, and H. T. PERKINS, 1945.
12. New Aspects of John and William Hunter. By JANE M. OPPENHEIMER, 1946.
13. Harvey Cushing: A Biography. By J. F. FULTON, 1946.
14. A Memoir to the Academy of Sciences at Paris on a new use of sulphuric ether. By W. T. G. MORTON. Reprinted 1946.



Wm. J. G. Morton

An engraved portrait of Morton in his twenty-eighth year.
From the frontispiece of the first edition of
Edward Warren's *Some account of the Letheon*
which appeared in March 1847

The Centennial of Surgical Anesthesia

AN ANNOTATED CATALOGUE
OF
BOOKS AND PAMPHLETS
BEARING ON THE EARLY HISTORY OF
SURGICAL ANESTHESIA

EXHIBITED AT THE
YALE MEDICAL LIBRARY
OCTOBER 1946

Compiled by
JOHN F. FULTON, M.D.
and
MADELINE E. STANTON, A.B.

NEW YORK
HENRY SCHUMAN

1946

COPYRIGHT BY
THE HISTORICAL LIBRARY
YALE UNIVERSITY SCHOOL OF MEDICINE
1946

THE SOUTHWORTH-ANTHOENSEN PRESS, PORTLAND, MAINE

Preface

THIS catalogue has been put together in preparation for a centennial exhibit at the Yale School of Medicine in October 1946 on the early history of surgical anesthesia. A similar exhibit had been on display at Yale in December 1944 to commemorate Horace Wells' first use of nitrous oxide for a tooth extraction, and in the interval many gaps in our anesthesia holdings have been filled, so that now our collection of the early writings on anesthesia, particularly of the ephemeral American ether pamphlets of 1846-1847, has become exceptionally full although not as yet complete. In the hope that a brief, annotated list of these tracts may be of help and interest to other libraries, we have decided to offer it as our small tribute in this anniversary year. We anticipate that the published list may aid in filling our gaps; we have in mind particularly those items represented only in photostat.

The classification chosen is one adapted to the collection, but we hope that it may be of use to others faced with the problem of cataloguing this diverse material. As we have only recently begun to collect in the modern period, the section on 'Regional and block anesthesia' and the large section on 'Individual anesthetics' (*i.e.*, those that have been introduced since 1875) have been omitted; they are in any event well covered in Keys' 'History' and the *Index-Catalogue of the Surgeon General's Office* and are not actually a part of the 'early history of surgical anesthesia.'

We place Crawford Long and Horace Wells before Bigelow and Morton, but we do not wish to imply by this that they are to be regarded as having introduced surgical anesthesia. Although they were both contemporaries of Morton, Long and Wells were forerunners as far as the actual introduction of the new procedure was concerned. Long, for whatever reason one wishes to give, had little influence upon the main channels of thought; and Wells, although he had grasped the concept of inhalation anesthesia and had used the procedure before Morton,

unfortunately did not rise above his initial defeats and disappointments and failed to convince his professional colleagues. We subscribe wholeheartedly to the conclusions of the late Sir William Osler whose comment about Morton may be cited not only as a fitting introduction to this catalogue, but actually as its *raison d'être*:*

The extraordinary controversy which has raged, and re-raged every few years, on the question to whom the world is indebted for the introduction of anæsthesia, illustrates the absence of true historical perspective, and a failure to realize just what priority means in the case of a great discovery.

Why do we not give the credit to Dioscorides, who described both the general and local forms, or to Pliny, or Apuleius, or to Hoa-tho, the Chinaman, who seems to be next in order, or to the inventor of the *Spongia somnifera*, or to Master Mazzeo Montagna, in Boccaccio, or to any one of the score or more of men in the Middle Ages who are known to have operated on patients made insensible by drugs or vapours? Why do we not give the credit to Davy, who had the idea; or to Hickman, who had both idea and practice; or to Esdaile, who operated on hundreds of patients in the hypnotic state; or to Elliotson, who did the same; or to Wells, who, in 1844, operated under nitrous oxide; or Long, who frequently practised ether anæsthesia? Why? Because time out of mind patients had been rendered insensible by potions or vapours, or by other methods, without any one man forcing any one method into general acceptance, or influencing in any way surgical practice.

Before October 16, 1846, surgical anæsthesia did not exist; within a few months it became a world-wide procedure; and the full credit for its introduction must be given to William Thomas Green Morton, who, on the date mentioned, demonstrated at the Massachusetts General Hospital the simplicity and safety of ether anæsthesia. On the priority question, let me quote two appropriate paragraphs: 'He becomes the true discoverer who establishes the truth; and the sign of the truth is the general acceptance. Whoever, therefore, resumes the investigation of neglected or repudiated doctrine, elicits its true demonstration, and discovers and explains the na-

* Osler, W. The first printed documents relating to modern surgical anæsthesia. *Proc. R. Soc. Med.*, 1918, 11 (Sect. Hist. Med.), 65-69; also *Ann. med. Hist.*, 1918, 1, 329-332.

ture of the errors which have led to its tacit or declared rejection, may certainly and confidently await the acknowledgements of his right in its discovery' (Owen, 'Homologies of the Skeleton,' p. 26). 'In science the credit goes to the man who convinces the world, not to the man to whom the idea first occurs' (Francis Darwin, *Eugenics Review*, 1914). Morton convinced the world; the credit is his.

Morton's original essays are among the *rarissima*, not existing, so far as I can ascertain, in any of the general or special libraries of this country [Great Britain]. I have been looking for them in vain for many years. In a parcel of his father's papers recently received from William J. Morton, of New York, there were duplicates of 'Letheon,' and 'On the Mode of Administration of Sulphuric Ether,' which I have great pleasure in presenting to the Library [Royal Society of Medicine]. Also a duplicate copy of the *Boston Medical and Surgical Journal* of November 18, 1846, which contains the first printed account of the new procedure, by Dr. Henry J. Bigelow. In the same journal for December 9, Dr. J. Collins Warren (primus) gives an account of the operation at the Massachusetts General Hospital. These four papers stand out in the literature of surgical anæsthesia as fundamental, and truly epoch-making.

Morton called the drug 'Letheon' and applied for Letters Patent to secure his rights—not an unethical procedure in the dental profession of America. This led to the publication of his first pamphlet called 'Letheon,' the bibliography of which some one should undertake.

If a title is listed in this catalogue, it means that the Library possesses it unless otherwise indicated. Entries marked with an asterisk are represented only in photostat or microfilm copies. The titles included in Section VII, not marked by an asterisk, are in bound volumes of journals belonging to our anesthesia collection unless the word "reprint" follows the entry, in which case the item exists as a separate.

We have made a census of the Morton tracts listed in Section IV, and all known copies are indicated. It has been our experience, however, that many libraries have not catalogued their nineteenth-century pamphlet material, so that other copies of these ephemeral items will undoubtedly be found, and any library having a large quantity of uncatalogued nine-

teenth-century tracts would do well to cull out the anesthesia material before it is lost. A large number of our own titles have come to light in this way; indeed our most valuable Morton and Warren tracts were bound in a two-volume collection marked "Ether papers" of which only the first tract had been catalogued.

We are indebted to many libraries for help when we attempted to locate the Letheon tracts. Their names are given under the List of Abbreviations. We must especially thank Mr. Wyllis Wright, Librarian of the Army Medical Library, for sending us detailed bibliographical information and for supplying many photostats. We are likewise indebted to Mr. E. Ashworth Underwood, Director of the Wellcome Historical Medical Museum of London, and to Dr. W. W. Francis of the Osler Library for sending us much-needed photostats. To Mrs. Henrietta T. Perkins and Miss Elizabeth H. Thomson of our Library staff we as usual owe much, especially for lending us a hand to make publication possible prior to 16 October 1946.

J. F. F.
M. E. S.

*Historical Library,
Yale University School of Medicine,
1 September 1946.*

Table of Contents

PREFACE	v
INTRODUCTION	xiii
I. FORERUNNERS OF SURGICAL ANESTHESIA	3
Sleeping potions	3
Physical agents	7
Nitrous oxide	8
Carbon dioxide	12
Mesmerism and hypnotism	15
Sulphuric ether	20
II. CRAWFORD WILLIAMSON LONG	26
Original papers	26
Biography and Commentary	28
III. HORACE WELLS AND NITROUS OXIDE	29
Original papers	30
Biography and Commentary	31
IV. WILLIAM T. G. MORTON, HENRY J. BIGELOW & EDWARD WARREN	36
Bigelow's original announcement	37
Morton's first announcements	40
Edward Warren's Letheon tracts	47
Morton's other writings on ether and chloroform	53
Biography, testimonials, hearings, etc.	63
V. CHARLES JACKSON	66
Original papers	66
Biography and Commentary	71
VI. SIR JAMES Y. SIMPSON AND CHLOROFORM	72
Original papers	73
Biography and Commentary	78

VII. OTHER STUDIES ON INDIVIDUAL SURGICAL	
ANESTHETICS (to 1875)	79
Opiates	79
Nitrous oxide	79
Mesmerism	80
Sulphuric ether	80
Chloroform	87
Ether and chloroform compared	88
VIII. EARLY GENERAL MONOGRAPHS ON SURGI-	
CAL ANESTHESIA	90
IX. REGIONAL AND BLOCK ANESTHESIA	91
(To follow in Part II of this Catalogue)	
X. STUDIES ON INDIVIDUAL ANESTHETICS	
(after 1875)	91
(To follow in Part II of this Catalogue)	
XI. ANESTHESIA AND PSYCHIATRY	92
XII. HISTORY AND BIBLIOGRAPHY OF SURGICAL	
ANESTHESIA	94
Journal articles	95
Monographs and Addresses	96
ADDENDUM	98
INDEX	99

List of Illustrations

Wm. T. G. Morton	Frontispiece	
FIG. 1.	<i>Title-page of Hickman, on Suspended Animation</i>	13
FIG. 2.	<i>Title-page of Turner, on Æther</i>	23
FIG. 3.	<i>Text of Horace Wells' first claim as it appeared in the Hartford Courant for 9 December 1846</i> (Courtesy of the <i>Hartford Courant</i>)	31
FIG. 4.	<i>Title-page of Wells, on Nitrous Oxide Gas</i>	33
FIG. 5.	<i>Morton's Notice 'To Surgeons and Physicians'</i>	41
FIG. 6.	<i>Notice of Morton's Letheon from the rear advertising cover of the Boston Medical and Surgical Journal for 9 December 1846</i>	43
FIG. 7.	<i>Title-page of the first edition (38 pp.) of Edward Warren's Letheon tract</i>	49
FIG. 8.	<i>Title-page of the first (French) edition of Morton's Memoir to the Academy of Sciences at Paris</i>	57

Introduction

IN surveying the early literature of surgical anesthesia, it is essential to maintain complete objectivity. The most reasonable and dispassionate analyses of the controversy are undoubtedly those of Osler, cited in the Preface, and of William Welch in his *Ether Day Address* of 1908. More detailed appraisals have recently appeared in anticipation of the ether centennial, three in this country and two in Great Britain: Keys' *History of surgical anesthesia* (1945) with its valuable bibliographical lists; Raper's *Man against pain* (1945); Robinson's *Victory over pain* (1946); Bankoff's *Conquest of pain* (1946), and E. S. Ellis's *Ancient anodynes* (1946). In addition there is a recent study by James Flexner in his *Doctors on horseback* (1937), and a popular novel has also appeared portraying Morton (Rachel Baker's *Dr. Morton, pioneer in the use of ether*, 1946).

These studies all support Osler and Welch in their conclusions that Morton rather than Long, Wells, or Jackson deserves primary credit for the introduction of surgical anesthesia. No one, however, can contest Long's priority in time for surgical procedures (although we now know that both Clarke and Pope used ether for tooth extraction prior to Long; see p. 25). No one disputes the fact that Horace Wells greatly influenced Morton's thinking, and probably first suggested to him that volatile agents might be used to alleviate pain in dental procedures and perhaps in the major operations of surgery. Few question Jackson's statement that he anesthetized himself with ether (possibly in 1841 and certainly in 1845), or that he suggested that Morton try it for surgical procedures. The authors of the recent centennial histories have accepted all this, but their interpretations differ in some details. Thus Raper stresses the importance of Wells' early studies and the influence that he exerted on Morton; and he censures Morton for his loose public utterances, especially toward the end of his life. No one of the recent historians of anesthesia feels impelled to support

the claims of Jackson, important as his influence must have been. Our British colleagues, Ellis and Bankoff, have written lucidly but without full access to American source material; yet they, too, believe that Morton deserves chief credit.

Close scrutiny of the contemporary documents, and particularly of the Morton and Warren Letheon pamphlets, which have not previously been studied in sequence and as a whole, make it clear that Morton would undoubtedly have rested his case and not reopened it in the spring of 1847, had he not been forced to do so by Jackson's aggressiveness. There can be little doubt that Morton was justified in defending himself publicly against Jackson's agitated claims and his insidious opposition to every attempt, public and private, to give Morton credit for his achievement. When Morton discovered that Jackson had broken faith by surreptitiously presenting to the French Academy an undivided claim for the credit of introducing ether as a surgical anesthetic, he enlisted the services of Edward Warren as a paid literary agent. To support Morton's case Warren, month by month from March through July 1847, issued edition after edition of a pamphlet which carried the title *Some account of the Letheon, or, who was the discoverer?* in which were assembled letters, editorials, and testimonials of every description in support of Morton's cause. Then followed the interminable Congressional hearings which dragged on for twenty years.

The controversy was still unsettled when Morton had a cerebral hemorrhage on 15 July 1868, shortly after he had read J. H. Abbot's paper in support of Jackson in the *Atlantic Monthly* for June 1868. Jackson in turn had an acute maniacal attack when in 1873 he stumbled upon Morton's epitaph in Mount Auburn Cemetery: "William T. G. Morton, Inventor and Revealer of Anesthetic Inhalation. By whom pain in surgery was averted and annulled. Before whom in all time surgery was agony. Since whom science has control of pain." Thereafter Jackson, who had completely lost his reason, was confined in the McLean Hospital where he eventually died in 1880.

It is regrettable that so great a discovery should have aroused such bitterness and so much local and international embarrassment; but the supreme importance of the achievement so far overshadows its less happy sequelae—the attempt to secure a patent, the petty feuds and jealousies—that we, at this distance in time, can largely forget the unpleasantness and view the discovery in its broad perspective.

The most outstanding fact about this discovery of a hundred years ago is that it represented a glorious triumph of youth, for the real innovators in the story of anesthesia were all young, several of them very young, at the time they did their most original work—a fact which medical students should never forget. Davy was scarcely twenty-one when he carried out his studies on nitrous oxide, and Barton was also twenty-one when he made his. Hickman was twenty when admitted to the Royal College of Surgeons and twenty-four when he carried out his celebrated experiments on carbon dioxide. Faraday was twenty-six when he published his note on ether inhalation. Horace Wells was twenty-three when he wrote his book on teeth and twenty-nine when he used (on himself) nitrous oxide for an extraction. Morton and Long were each twenty-seven when they first used ether, and Bigelow twenty-eight when he made the announcement to the world. Even Jackson and Simpson, the eldest two of the group, were only thirty-six when they first experimented with ether and chloroform.

But while youth has the courage to break with tradition and to blaze new trails, it lacks the seasoned judgment of maturer years, is easily influenced, and is often intolerant and defensive in its reactions. Indeed, one might find excuse for all the initial bitterness of the ether controversy by taking the wider view that the claimants, being young, eventually came to defend, not so much their priority in a great discovery, as their own personal integrity, for they frequently impugned one another's honesty. But whatever view one takes of the discovery of surgical anesthesia, one must never lose sight of the fact that these young men by their imagination and their daring made a contribution that places the world forever in their debt.

SURGICAL ANESTHESIA

LIST OF ABBREVIATIONS

An-C-MM-Os	Osler Library, McGill University, Montreal, Canada
Clendening	Library of the late Dr. Logan Clendening, Kansas City, Missouri
CtHM	Hartford Medical Society, Hartford, Connecticut
CtY	Yale University, New Haven, Connecticut
CU-M	Medical Center Library, California University, San Francisco, California
DLC	Library of Congress, Washington, D. C.
DSC	Office of the Surgeon General (Army Medical Library), Washington, D. C.
Horine	Dr. E. F. Horine, Louisville, Kentucky
Howe	P. D. Howe, Esq., Boston, Massachusetts
MB	Boston Public Library, Boston, Massachusetts
MBA _t	Boston Athenæum, Boston, Massachusetts
MBM	Boston Medical Library, Boston, Massachusetts
MBMGH	Massachusetts General Hospital, Boston, Massachusetts
MH	Harvard University, Cambridge, Massachusetts
MH-M	Harvard Medical School, Boston, Massachusetts
MHi	Massachusetts Historical Society, Boston, Massachusetts
MWA	American Antiquarian Society, Worcester, Massachusetts
MSaE	Essex Institute, Salem, Massachusetts
MdBm	Medical and Chirurgical Faculty of the State of Maryland, Baltimore, Maryland
MdU-D	Dental Library, University of Maryland, Baltimore, Maryland
NN	New York Public Library, New York City
NNC	Columbia University, New York City
NNC-M	Medical Library, Columbia University, New York City
NNNAM	New York Academy of Medicine, New York City
PPCP	College of Physicians, Philadelphia, Pennsylvania
PPiU-D	School of Dentistry, University of Pittsburgh, Pittsburgh, Pennsylvania
RSM	Royal Society of Medicine, London, England
Trent	Dr. J. C. Trent, Durham, North Carolina
TxU-M	Medical School, University of Texas, Galveston, Texas
WU	University of Wisconsin, Madison, Wisconsin

I. FORERUNNERS OF SURGICAL ANESTHESIA

Sleeping Potions

SINCE the dawn of history, those who have cared for the sick and wounded have sought ways and means of alleviating pain. Marguerite-Louise Baur in her *Recherches sur l'histoire de l'anesthésie avant 1846* (1927) and E. S. Ellis in his recent volume, *Ancient anodynes. Primitive anæsthesia and allied conditions* (1946) have described the early narcotic potions, many of which have been used since prehistoric times to numb the senses. One of the best known was the concoction made of the mandrake (mandragora) which figures prominently in Dioscorides, Apuleius, and Pliny* and which we now know contained alkaloids of the scopolamine group. Thus in Dioscorides we find the following:

But of ye male [mandragora], and white which some have called Norion, ye leaves are greater, white, broad, smooth as of the beet, and ye apples twice as big, drawing to saffron in ye colour, sweet smelling with a certain strongness which also ye shepherds eating are in a manner made asleep. . . . And some do seeth the roots in wine to thirds, & straining it set it up. Using a Cyathus of it for such as cannot sleep, or are grievously pained, & upon whom being cut, or cauterized they wish to make a not-feeling pain. . . . Ye wine of ye bark of ye root is prepared without seething but you must cast in 3 pounds into a Metreta of sweet wine, & that there be given of it 3 Cyathi to such as shall be cut, or cauterized, as is aforesaid. For they do not apprehend the pain, because they are overborn with dead sleep, but the apples being smelled to, or eaten, are soporiferous, & ye juice that is of them.

In Philemon Holland's translation of Pliny's *Historia naturalis* one reads: "It is an ordinarie thing to drinke it [juice of mandragora] . . . before the cutting, cauterizing, pricking or launcing of any member, to take away the sence and feeling of such extreame cures. And sufficient it is in some bodies to cast them into a sleepe with the smell of Mandrage, against the time of such Chirurgerie." The Osler catalogue records similarly that a

* See Thompson, C. J. S. *The mystic mandrake*. London, 1934, 253 pp.

preparation of hemp was used as a surgical anesthetic by Hoatho in China in the second century. The first reference to an anesthetic agent in English appears to be that of William Bullein who wrote (1562): "This herbe [mandrake] . . . haue vertue, to cause depe slepe: . . . The iuce of this herbe pressed forth, and kepte in a close yearthen vessell, accordyng to arte: this bryngeth slepe, and casteth men into a trās on a depe tirrible dreame, untill he be cutte of the stone. . . . If the roote bee cutte in sondrie places, there will come forth a worthie iuce, to anoint the forehed, to bryng slepe."

Another anodyne that figures prominently in mediaeval literature was the so-called soporific sponge (*spongia somnifera*) which Nicolas of Salerno prepared thus, as recorded in his *Antidotarium*:

Take of opium of Thebes one ounce, juice of hyoscyamus, juice of unripe blackberries, juice of hemlock, poppy capsules, juice of mandragora, juice of wood-ivy, of each one ounce. Put all these into a vessel together with a new sponge which is just as it came from the sea and has not been in contact with fresh water. Place the vessel in the sun during the dog-days until all [the ingredients] are consumed. When the sponge is needed, moisten it with a little hot water and apply it to the patient's nostrils, and he will quickly fall asleep. When you wish to rouse him, apply the juice of fennel-root, and he will soon wake.

This particular concoction was revived in 1847 by a Dr. Dau-riol of Toulouse as a substitute for ether (see p. 79). It was no doubt this preparation or some variant of it which was the sleep potion that Shakespeare mentions in various of his plays.

In our exhibit there were represented the works of Dioscorides, Pliny, Bullein, and Nicholas of Salerno, but since their bearing on the introduction of surgical anesthesia is somewhat remote, these volumes will not be described in detail.

I. 1.

DIOSCORIDES. De materia medica, etc. (Greek) Ed. princeps.

Venice: Aldus [Manutius], July 1499. Folio.

Note: Not only did Dioscorides give mandragora wine to his surgical patients to diminish their agony; he also applied the "Memphitic stone" to parts to be cut or cauterized and stated that he could 'induce a safe local anesthesia' (Bk. V,

Ch. 158, old style). He thus introduced the term 'anæsthesia' which was revived by Quistorp (1719), by Elliottson (1843) and again by Oliver Wendell Holmes (1846). The passage quoted above from Dioscorides is taken from Robert T. Gunther's *The Greek herbal of Dioscorides . . . englished by John Godyer A.D. 1655*. Oxford, 1934 (Bk. IV. 76, pp. 473-474). In the original Greek edition the word 'anæsthesia' occurs in line 12 on the recto of leaf iii of quire omicron (o).

I. 2.

PLINY. The historie of the world. Commonly called, The natural historie of C. Plinius Secundus. Translated into English by Philemon Holland Doctor in Physicke. London, Printed by Adam Islip, 1601. Folio, 2 vols. in 1.

Note: The passage describing the use of mandragora occurs in Vol. 2, Bk. XXV, Ch. XIII, p. 235.

I. 3.

BULLEINS Bulwarke of defence against all sicknes, sornes, and woundes, that dooe daily assaulte mankinde. . . . Doen by Williyam Bulleyn, and ended this Marche. Anno salutis. 1562. Imprinted at London, by Ihon Kyngeston.

Note: The quotation above comes from folio 44 recto (h2a), the marginal notation being: "The vertues of Mandrak, is to make one to slepe."

I. 4.

NICOLAUS SALERNITANUS. L'Antidotaire Nicolas . . . par Le Dr. Paul Dorveaux. . . . Paris, H. Welter, Editeur, 1896.

Note: The *Antidotarium* (Venice, Nicolaus Jenson, 1471) contains on folio 33b the passage about the soporific sponge quoted from the Osler catalogue. Since Yale has no edition of this work, a copy of Dorveaux's *L'Antidotaire Nicolas* is cited. This contains French translations from two manuscript copies of the *Antidotarium*, and on page 21, paragraph 46, occurs the account of "*Oleum mandragoratum*," a sleeping potion with formula closely similar to that of the *spongia somnifera* found in the early printed editions of Nicolas.

A little-known résumé of ancient and Renaissance ideas concerning sleeping potions, consciousness, and the relation between consciousness and bodily function is contained in a surprising dissertation by Johann Bernard Quistorp entitled *De anæsthesia* issued at Rostock in 1718. For some reason this seems to have escaped detailed study, and since it stands as the record of a man who had obviously thought seriously about the

problems of sensation and consciousness and abnormal deviations in these spheres (such as that of an obstinate villain who merely went to sleep while being horribly tortured), it deserves consideration at this time.

I. 5.

QUISTORP'S 'DE ANÆSTHESIA'

Rostock, 1718.

Title: G. D. S. P. | Disputatio inauguralis medica | de | Anæsthesia | von dem unempfindlich seyn | quam . . . | præsidente pro-decano | . . . | Dn. Georgio De- | thardingio, | . . . | publico examini submittit | Johannes Bernhardus Qui- | storpius, Rostochiensis. | . . . MDCCXVIII. . . . | Rostochii, Typis Joh. WeppplingI. Seren. Princ. & Univ. Typ.

Collation: 4°. A-F⁴; 24 ll. (no pagination).

Contents: A1a title; A1b 'Deo patriae parenti et præceptoribus'; A2a-F4b text.

Note: Johann Bernard Quistorp (1692-1761), son of a pharmacist, was born at Rostock in Mecklenburg. He studied there and at Leipzig and in 1743 was made professor of medicine at Rostock and 'Stadtphysicus.' His thesis is nowhere described in the anesthesia literature, but it clearly deserves close scrutiny if for no other reason than that he resurrected the word and used it almost in the modern sense. He begins with a philosophical disquisition, partly in Latin, partly in German, on whether the soul leaves the body when consciousness is lost 'sub anæsthesia.' There is a long section on why pain is not always experienced during torture and especially during the agony of crucifixion. Quistorp recognizes seven different usages of the word and gives seven alternative definitions, his first being 'denegatio sensationis per totum corporis' without affecting individual organs, respiration, or the pulse. He then gives an erudite discussion of its Greek origin and the Latin equivalent 'insensibilitas.'

Copy: Photostat from Army Medical Library.

The use of intoxicating beverages for anesthetic purposes also dates back to Dioscorides who introduced many effective potions. He recommended one cyathus of heavy wine (*ca.* 2 oz.) for those who were to be cut for stone or cauterized. During the sixteenth and seventeenth centuries it came to be common practice to insure drunkenness prior to a major amputation, but no one writer can be singled out as having fostered alcoholic narcosis for surgical anesthesia. Osler draws attention to the Memoirs of Galton who as a house surgeon recalled a drayman who was brought in dead drunk and underwent amputation of both legs without signs of pain; this led Galton to wonder, as

many had before him, whether patients might not with advantage be made drunk prior to any surgical procedure.

Physical Agents

Another method for allaying pain was chilling of the part. Avicenna had listed snow and ice-cold water as two of the less powerful stupeficients,* and Severinus** in 1646 had suggested the use of freezing mixtures of snow and ice for surgical anesthesia. This same method was also widely employed during the second World War by Russian surgeons when operating without adequate facilities on the field of battle, for a frozen or near-frozen part can be removed with a minimum of discomfort.

More modern was the practice of nerve compression introduced in 1784 by the London surgeon, James Moore, whose important book on the prevention of pain in operations of surgery deserves to be more widely known.

I. 6.

MOORE ON PREVENTING PAIN

London, 1784.

Title: A | Method | of | preventing or diminishing pain | in |
several operations | of | surgery. | By James Moore, | Mem-
ber of the Surgeons Company of London. | [double rule] |
London: | Printed for T. Cadell, in the Strand. | MDCCLXXXIV.
| [Price Two Shillings.] |

Collation: 4°. [A]², B-G⁴, H¹; 1 l., [1]-50 pp., 1 folding pl. between E₁ and E₂.

Contents: [A]₁ blank; [A]_{2a} title; [A]_{2b} blank; B_{1a}-H_{1b} text.

Note: Moore describes a pressure clamp (shown on the folding plate) designed to exert local pressure on the major nerve trunks, but, as Ellis records, "the fact that he was in the habit of giving a grain of opium at the same time gave rise to cynical remarks by some of his friends. Nevertheless, after pressure had been put on the anterior crural and sciatic nerves with a machine made for the purpose at St. George's Hospital, and John Hunter had amputated a leg below the knee, he declared that the pain had been greatly diminished. This may not, of course, be strictly accurate, but the presumption is that it was quite a good anæsthetic considering the date at which the operation occurred. The experiment, how-

* Gruner, O. C. *A treatise on the canon of medicine of Avicenna, incorporating a translation of the first book.* London, 1930. (Paragraph 1075.)

** Severinus, M. A. *De efficaci medicina libri iii.* Frankfurt, 1646. (Edition consulted: *De la Médecine efficace.* Geneva, 1668.)

ever, did not provoke sufficient interest for anyone to follow it up and this one attempt to treat anæsthesia other than empirically died a natural death."

Copy: Photostat from Army Medical Library.

Nitrous Oxide

The use of volatile agents to abrogate sensation had its primary origin in the work of three men: Joseph Priestley, Thomas Beddoes, and Humphry Davy. In 1772 Priestley discovered nitrous oxide, and he was also largely responsible for introducing the modern chemical study of the gases. He had not observed the exhilarating effects of nitrous oxide inhalation, but after discovering oxygen in 1774 he cautiously suggested that inhalation of certain gases might be of therapeutic benefit, particularly for diseases involving the lungs. His suggestion was taken up both in England and on the Continent, and Thomas Beddoes of Bristol was so impressed by Priestley's studies that in 1794 he and James Watt, the inventor of the steam-engine, published a book on the medical uses of the so-called "factitious airs," which enjoyed great popularity.

I. 7.

PRIESTLEY ON NITROUS OXIDE

London, March 1772.

Title: Observations on different kinds of Air. By Joseph Priestley, LL.D. F.R.S. *Philosophical Transactions of the Royal Society*, 1772, 62, 147-264.

Note: Stephen Hales had evidently seen nitrous oxide evolved sometime before 1731 and Priestley made generous reference to his study (p. 210). Priestley continued (pp. 210-211; having evidently added to his MS. later in the year):

"Beginning with the solution of brass, on the 4th of June 1772, I first found this remarkable species of air; one effect of which, though it was casually observed by Dr. Hales, he gave little attention to; and which, as far as I know, has passed altogether unnoticed since his time, insomuch that no name has been given to it. I therefore found myself, contrary to my first resolution, under an absolute necessity of giving a name to this kind of air myself. When I first began to speak and write of it to my friends, I happened to distinguish it by the name of nitrous air, because I had procured it by means of spirit of nitre only; and though I cannot say that I altogether like the term, because this air is not got from all the metals by the same spirit, neither myself nor any of my friends, to whom I have applied for the purpose, have been able to hit upon a better; so that I am obliged, after all, to content myself with it. . . . One of the most conspicuous properties of this kind of air is the great diminution of any quantity of common air with which it is mixed, attended with a turbid red, or deep

orange colour, and a considerable heat. The smell of it, also, is very strong, and remarkable, but very much resembling that of smoking spirit of nitre."

I. 8.

BEDDOES & WATT ON FACTITIOUS AIRS

Bristol [1794].

Title: Considerations | on the | medicinal use | of | factitious
airs, | and | on the manner | of | obtaining them in large
quantities. | In two parts. | Part I. by Thomas Beddoes, M.D.
| Part II. by James Watt, Esq. | [double rule] | Bristol: |
printed by Bulgin and Rosser, | . . . | [short rule] | Price two
shillings and sixpence.

Collation: 8°. A^s, B-E⁴, A^s, B-C⁴; 48, 32 pp.; errata slip; 3 plates (2 folding).

Contents: p.[1] title; p.[2] blank; p. 3 explanatory note; pp. 4-7 Proposal; p.[8] blank; pp. 9-48 text of Part I (by Beddoes); pp. 1-27 text of Part II (by Watt); p.[28] blank; p.[29] Contents; p.[30] other books by Beddoes; pp. 31-32 'Hyper-criticism.'

Illustrations: The three plates show Watt's pneumatic apparatus for administering the gas.

Note: This is the rare first edition of the Beddoes-Watt tract. In the second edition which was much expanded (168, 40 pp.) Beddoes states: "The former edition of this pamphlet, consisting of between 500 and 600 copies, appeared in the middle of October, 1794. The booksellers had disposed of most of the copies in a few weeks; and in less than four months a new impression became necessary." Of Watt's contribution the *D.N.B.* states: "Watt had his interest in chemical science still further stimulated by the hope of benefiting the health of his invalid son, Gregory, by the inhaling of gases, called in those days 'factitious airs.' This mode of cure was advocated by the celebrated Dr. Thomas Beddoes, and Watt devised an apparatus to be used in hospitals, and of a smaller size in private houses, for the generation of the 'airs,' and in 1795 published a pamphlet [the second edition], with illustrations, prices, and directions for use. Two principal 'airs' were to be produced, the one oxygen and the other hydro-carbonate; this appears to have been a mixture of hydrogen, carbonic acid, and some carbonic oxide. This horrible compound was not supposed to be of the best kind, nor to do its work properly, unless it had the effect of producing in the unhappy inhaler an attack of vertigo."

Ether inhalation. The second edition of this tract is noteworthy for a letter (pp. 74-76) from Richard Pearson dated 'Birmingham, Feb. 2, 1795' describing the effects of ether inhalation on cases of tuberculosis. He writes: "In my little publication, I can scarcely call any thing my own, but the observations on the *vapour of æther*, of the probable use of which in phthisical cases, your considerations on Factitious Airs first gave me the idea. As the number of consumptive persons in this large manufacturing town is deplorably great, I have had frequent opportunities of trying the inhalation of æther in such cases; and I have the satisfaction to say that I have found it very beneficial. It abates the hectic heat, relieves and often removes the dyspnœa, and promotes and improves the expectoration. It seems to have such an effect as a mixture of inflammable and fixed air (duly diluted with common air) would have; and where the factitious airs cannot be

had, it may be used in their stead with great advantage." Pearson described his observations with ether more in detail in a tract not available for our exhibit entitled: *A short account of the nature and properties of different kinds of airs . . . intended as an introduction to the pneumatic method of treating diseases . . .* (Birmingham &c., 1795.)

Humphry Davy as a lad of twenty was invited by Beddoes to come as an assistant to his Pneumatic Institute at Bristol; there Davy soon devised an improved method for producing nitrous oxide, and in 1799 at the age of twenty-one he studied the effects of its inhalation both in man and animals, using for his human subjects a group of men who were then the centre of intellectual life in Bristol: Samuel Taylor Coleridge, Robert Southey, James Thomson, Peter Roget (he of the *Thesaurus*), Tom Wedgwood, and other prominent literary figures. So impressed was Davy by the testimony of his unusually articulate subjects that he drew the conclusion (*Researches*, p. 556): "As nitrous oxide in its extensive operation appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place."

I. g.

DAVY ON NITROUS OXIDE

London, 1800.

Title: Researches, | chemical and philosophical; | chiefly concerning | nitrous oxide, | or | dephlogisticated nitrous air, | and its | respiration. | By Humphry Davy, | Superintendent of the Medical Pneumatic | Institution. | [horizontal device] | London: | Printed for J. Johnson, St. Paul's Church-Yard. | By Biggs and Cottle, Bristol. | 1800.

Collation: 8°. Engr. frontispiece, xvi pp., 1 l., [1]-580 pp., 1 l.; [*]¹⁰, A-Z⁸, Aa-Mm⁸, Nn³.

Contents: [*]^{1a} title; [*]^{1b} blank; [*]^{2a-5b} (pp.iii-x) Contents; [*]^{6a-8b} (pp. xi-xvi) Introduction; [*]⁹ blank (cancelled); [*]^{10a} half-title; [*]^{10b} blank; A^{1a}-P^{4b} (pp. 1-232) Research I, Production of nitrous oxide; P^{5a}-W^{4a} (pp. 233-329) Research II, Combinations of nitrous oxide; W^{5a}-Ee^{1b} (pp. 330-450) Research III, Respiration of nitrous oxide; Ee^{2a}-Mm^{8b} (pp. 451-576) Research IV, Effects of nitrous oxide respiration [in man]; Nn^{1a}-Nn^{2b} (pp. 577-580) Proposal for the preservation of accidental observations in medicine (signed: Thomas Beddoes, Clifton, June 1800); Nn^{3a} Errata; Nn^{3b} advertisement.

Frontispiece: Mercurial air-holder and breathing machine.

Note: This is one of the most remarkable books in the history of science. In the first place, when it was published its author had scarcely turned 22 years of age. In 1798 Thomas Beddoes had enlisted young Davy's services and had assigned him several problems, the first of which resulted in a premature and ill-timed publication on light and colors issued in 1799. As soon as Davy turned his attention to nitrous oxide, however, his scientific genius quickly manifested itself.

Nitrous oxide seemed to attract young and inquisitive minds, for we next find it being studied by a talented young American, William P. C. Barton, who had distinguished himself as a science student at Princeton University and who had then apprenticed himself to Benjamin Rush of Philadelphia.

I. 10.

BARTON ON NITROUS OXIDE

Philadelphia, 1808.

Title: A | dissertation | on | the chymical properties | and |
exhilarating effects | of | nitrous oxide gas; | and its | applica-
tion to pneumattick medicine; | submitted as | an inaugural
thesis | for | the degree of doctor of medicine. | [double short
rule] | By William P. C. Barton, A.B. | of Philadelphia; | . . .
| Philadelphia: | printed for the author, at the Lorenzo Press.
| 1808.

Collation: 8°. [A]¹⁰, B-N⁴, [O]¹; [xx], 95 pp., 1 l.

Contents: pp.[i-ii] blank; p.[iii] title; p.[iv] blank; p.[v] dissertation title; p.[vi] blank; p.[vii] dedication to Benjamin Smith Barton 'by his affectionate pupil and nephew'; p.[viii] blank; p.[ix] dedication to his father; p.[x] blank; p.[xi] dedication to the Rev. Samuel Stanhope Smith, D.D.; p.[xii] blank; pp.[xiii-xvi] Preface; pp.[xvii-xviii] Index; p.[xix] Advertisement; p.[xx] blank; pp.[1]-94 text; p. 95 acknowledgement to his professors; p.[96] blank; final leaf blank.

Note: William P. C. Barton, who later became the first chief of the Bureau of Medicine and Surgery of the U. S. Navy, was one of many brilliant students who had been inspired by Benjamin Rush. Barton (at 21 years of age) repeated Davy's experiments with nitrous oxide and gave a brilliant description of the sensations experienced during its inhalation—a description which is even more vivid than those of Coleridge and Robert Southey. Barton was aware that nitrous oxide destroyed physical pain and he speculated as did Davy concerning its possible uses in medicine and surgery, but he did not grasp as clearly as had Davy the possibility of using the gas as a general surgical anesthetic. There can be no doubt, however, that Barton's thesis did much to rouse interest in the use of gaseous inhalations.

Another forerunner in the history of surgical anesthesia who might have won the laurels was Henry Hill Hickman, a brilliant young Englishman who at the early age of twenty was admitted to the Royal College of Surgeons and at twenty-four carried out a series of surgical operations on animals under the influence of carbon dioxide without sign of pain. His fifth experiment may be cited:

An adult dog was rendered insensible by means similar to the preceding, and the muscles and blood-vessels of one of its legs were divided. There was no hemorrhage from the smaller vessels; a ligature which secured the main artery came away on the fourth day, and the animal recovered without having at any period shewn any material symptom of uneasiness. In this experiment animation was suspended during seventeen minutes, allowing respiration occasionally to intervene by means of inflating instruments.

He attempted to persuade his surgical colleagues, both at home and abroad, to try the gas to alleviate pain in human beings during surgical procedures. An account of his experiments was issued in 1824 in a letter on suspended animation. No one in England heeded it, and four years later he presented a memorial to Charles X of France. The French Academy of Medicine was asked to investigate his claims, but they failed to make a report. Hickman, as did Horace Wells later, became depressed and died prematurely at the age of thirty. His essay on suspended animation is represented in photostat and in a modern reprint issued by the Wellcome Historical Medical Museum of London.*

I. 11.

HICKMAN ON SUSPENDED ANIMATION *Ironbridge, 1824.*

Title: A | letter | on | suspended animation, | containing | experiments | . . . | . . . on animals | [etc.; see Fig. 1]

Collation: 8°. No signatures; [1-3], 4-14 pp.

Contents: p.[1] title; p.[2] blank; pp.[3]-5 'To the Public'; p.[6] blank; pp.[7]-14

* For a note on the commemoration of the centenary of Hickman's death, see the paper by the Right Hon. Lord Dawson of Penn, 'Henry Hill Hickman,' *Proc. R. Soc. Med.*, 1929-1930, 23 (sect. anesth.), 45-48.

A
LETTER
ON
SUSPENDED ANIMATION,
CONTAINING
EXPERIMENTS
Shewing that it may be safely employed during
OPERATIONS ON ANIMALS,
With the View of ascertaining
ITS PROBABLE UTILITY IN SURGICAL OPERATIONS ON THE
Human Subject,

Addressed to

T. A. KNIGHT, ESQ. OF DOWNTON CASTLE,
Herefordshire,

ONE OF THE PRESIDENTS OF THE ROYAL SOCIETY,

~~WHICH WAS READ AT THE ANNUAL MEETING OF THE SOCIETY AT BATH, IN 1824.~~

BY DR. H. HICKMAN,
OF SHIFFNAL ;

Member of the Royal Medical Societies of Edinburgh, and of
the Royal College of Surgeons, London.

IRONBRIDGE : Printed at the Office of W. Smith.
1824.

FIG. 1. Title-page of Hickman, on Suspended Animation

text, headed 'A letter, &c.' and signed (p.14) 'H. H. Hickman. *Shiffnal, Aug. 14th, 1824.*'

Note: Leake and Waters repeated Hickman's experiments in 1928 and confirmed his results ("The anesthetic value of carbon dioxide." *J. Pharmacol. exp. Therap.*, 1928, 33, 280-281). Hickman's observations stand as the first in which a volatile agent was used to produce insensibility during an actual surgical procedure, thus establishing on a solid basis the great principle underlying inhalation anesthesia.

Copy: The only copy traced is that in the Wellcome Historical Medical Museum, London, and we are much indebted to its Director, Dr. E. Ashworth Underwood, for making a positive photostat available.

I. 12.

HICKMAN SOUVENIR

London, 1930.

Title: SOUVENIR | Henry Hill Hickman | Centenary exhibition
| 1830-1930 | The Wellcome | Historical Medical Museum |
54, Wigmore Street, London, W. 1 | [ornament] | . . . | The
Wellcome Foundation Ltd. | London | Copyright 1930
Printed in England.

Collation: 4°. A1-4, A*2, A5-8, B-E8, F4, 2 plates; [1-13], 14-85 pp.

Contents: A1-2 blank; A3a half-title; A3b blank; pp.[3-4] frontispiece; A4a title; A4b copyright; A*1a [p.7] Preface by John D. Comrie; A*1b Hickman's scales; A*2a Contents; A*2b plan of Museum's first floor; A5a list of exhibits; A5b engraving of Tenbury; A6a-8a (pp.[13]-17) Foreword by Dudley Wilmot Buxton; A8b [p.18] Hickman's house and doorplate; pp.[19-20] painting of Hickman experimenting; B1a-5a (pp.[21]-29) 'Henry Hill Hickman' (biographical note with letters); B5b [p.30] title-page of Hickman's pamphlet; B6a-8a (pp. 31-35) text of pamphlet on suspended animation; B8b Hickman's appeal to King Charles X; C1a-E2b (pp. 37-[72]) further notes, letters and memorabilia; E3a-F1a (pp.[73]-85) Wellcome Bureau organization and publications.

Note: A centenary publication for Hickman. The later pages contain correspondence following the arrival abroad of accounts of the claims of Morton and Wells. The text of Wells' letter to the French Academy is reproduced both in French and English.

Carbon dioxide was also recommended by William Wright in 1829 for relief of deep-seated pain in the middle ear.

I. 13.

WRIGHT ON DEAFNESS

London, 1829.

Title: On the | varieties | of | deafness, | and | diseases of the
ear, | with | proposed methods of relieving them. | By Wil-
liam Wright, Esq. | . . . | London: | Hurst, Chance, and Co. |
[short rule] | 1829.

Collation: 8°. A-T⁸, U⁴; xvi, 295 pp.

Contents: A1a title; A1b 'Printed by Bradbury and Dent'; A2a Dedication to the Duke of Wellington; A2b blank; A3a-5b (pp. v-x) Introduction; A6a-8b (pp. xi-xvi) Table of Contents; B1a-U4a (pp. 1-295) text; U4b blank.

Note: After stating that carbonic acid, if introduced into the auditory passage, will relieve pain caused by inflammation of the middle ear, Wright makes a highly significant observation (pp. 162-163):

"The following experiment will shew the effect of this gas in relieving pain. Place a small piece of blister plaister on the finger, until a vesicle is raised, the skin of which being cut off, the action of the oxygen of the atmosphere will occasion pain. If the finger be now placed in a jar of oxygen gas, the pain will become almost unbearable; but ease will be instantly afforded, on the finger being introduced into a jar of carbonic acid gas. Carbonic acid gas has been applied with advantage to open cancers, on account of its antiseptic quality; it also is recommended medically by many, who never think of the cause why soda, seltzer, and other waters are deemed beneficial. If this gas were not present in most of our celebrated mineral waters, the substances held in solution by it would be precipitated: in proof of this fact, take the strongest chalybeate water; its iron becomes oxide of that metal by exposure to air, which causes the carbonic acid gas to evaporate."

Mesmerism and Hypnotism

Friedrich A. Mesmer, who graduated from the University of Vienna in 1766, startled a restless world in 1779 by publishing his pretensions concerning animal magnetism and his power of transmitting cosmic energy from his own body to that of his afflicted patients. He soon demonstrated his capacity to bring certain subjects under hypnotic influence, and while he aroused intense opposition among physicians and scientists of France, he had a large following, and one of his pupils, Count Maxime Puységur of Busancy, suggested the use of mesmerism to diminish pain during surgical procedures. Count Puységur's proposal was several times investigated by committees of the French Academy, but in 1837 a committee reported adversely on the suggestion. In spite of this, interest in the subject continued, especially in Great Britain.

Since Mesmer himself did not appreciate the possibilities of animal magnetism as a means of securing surgical anesthesia, his voluminous writings have not been cited in this catalogue.

The possibility of using mesmerism for anesthesia was actively fostered by three British surgeons: John Elliotson, the physiologist (1791-1868), James Esdaile (1808-1859), and James

Braid (1795-1860). Each in turn maintained that he could carry out surgical procedures when his patients were hypnotized, and their several publications which now follow are generally regarded as important milestones in the history of surgical anesthesia. It is of interest that these publications coincided closely in time with the ether discovery.

John Elliotson was a man of considerable eminence, having been largely responsible for the founding of University College Hospital in London. He gave both the Lumleian and Harveian orations and he was also a Fellow of the Royal Society. A more unusual honor was the dedication of *Pendennis* to him by his friend, William Makepeace Thackeray. Elliotson was clearly a man whose voice would be heard. He had become interested in mesmerism in the early forties and in 1843 published his first book describing numerous cases of surgical procedures carried out without pain while his patients were hypnotized. The cautious medical profession of Great Britain did not permit these claims to go unchallenged, and things were eventually made so uncomfortable for Elliotson that he was obliged to resign his various offices including his professorship at the University of London.

I. 14.

ELLIOTSON ON MESMERISM

London, 1843.

Title: Numerous cases | of | surgical operations | without pain
| in | the mesmeric state; | with | remarks | upon the opposi-
tion of many members of the Royal Medical | and Chirurgi-
cal Society and others | to the reception of | the inestimable
blessings of mesmerism. | [5 lines of quotations] | by | John
Elliotson, M.D. Cantab. F.R.S. | London: | H. Baillière, 219,
Regent Street. | [brief rule] | MDCCCXLIII

Collation: 8°. [1-5], 6-93, [94-96] pp.

Contents: p.[1] title; p.[2] printers' notation; p.[3] dedication: 'To those, however humble their rank, who prize truth above the favour of the ignorant or interested,' [etc.]; p.[4] blank; pp.[5]-93 text; p.[94] errata; p.[95] 'Also by the same author'; p.[96] blank.

Note: This records in detail the case of a 42-year-old laborer with ulcerated knee who while mesmerized had his leg amputated by W. Squire Ward. A lively verbal

tilt followed when the case was reported, and the bulk of the book is taken up with details of the controversy which Elliotson set down with all the zeal of a Scottish Covenanter. Other cases are then described. On page 65 Elliotson uses the word "anæsthesia": "For a length of time she had perfect loss of the sense of touch,—anæsthesia, in her ecstatic delirium."

I. 15.

ELLIOTSON'S HARVEIAN ORATION

London, 27 June 1846.

Title: The | Harveian Oration, | delivered before the | Royal
College of Physicians, London, | June 27th, 1846, | by | John
Elliotson, M.D. Cantab. F.R.S. | Fellow of the College. | [half
rule] | With | an English version and notes. | [ornament] |
London: | H. Baillière, 219, Regent Street. | M DCCC XLVI.

Collation: 8°. [A]³, B-E⁸, F³; 3 p. l., 70 pp.

Contents: p.[i] title; p.[ii] printers' notation; p.[iii] 'Advertisement'; p.[iv] blank; p.[v] Latin half-title; p.[vi] blank; pp.[1]-34 Latin text; p.[35] English half-title; p.[36] blank; pp.[37]-70 English text.

Note: Elliotson, the scholarly fighting Scot, was at the top of his form in his Harveian Oration. His latinity impeccable, he reviewed in stentorian periods the history of new discoveries: how Harvey was himself pilloried by his enemies; how Jenner was similarly crucified; and how now those who were attempting to alleviate human suffering through acceptance of a great new truth (mesmerism) were being ignominiously reviled. In the final flourish of his address, Elliotson again uses the word "anæsthesia." Thus he writes:

"The loss of common feeling—anæsthesia, is but a form of palsy, and in it wounds give no pain. If this condition can be induced temporarily by art, we of necessity enable persons to undergo surgical operations without suffering. Whether the artificial production of those phenomena, or the performance of the processes which so often induce them, will mitigate or cure disease, can likewise be determined by experience only. It is the imperative, the solemn, duty of the profession, anxiously and dispassionately to determine these points by experiment, each man for himself. I have done so for ten years, and fearlessly declare that the phenomena, the prevention of pain under surgical operations, the production of repose and comfort in disease, and the cure of many diseases, even after the failure of all ordinary means, are true. In the name, therefore, of the love of truth, in the name of the dignity of our profession, in the name of the good of all mankind, I implore you carefully to investigate this important subject."

Though Elliotson was obviously a master of Latin prose and handled the language with the relish and fluency of an age that is past, he wished to reach a larger audience; he accordingly issued the Oration in bilingual form with this apology: "I have published it in this form, because I considered it *my duty* to declare my conviction of the truth of Mesmerism before the assembled members of the College of Physicians, and am anxious that the public should know the fact. It is but justice to myself; and I feel assured that my readers will take the same view, if they recall the proceedings of the last ten years." The Latin text varies slightly from the English in the sentence referring to anesthesia. It runs: "Communis sensus suspensio: sive, ut Græco verbo utar, ἀναισθησία, quid est, nisi paralysis species, in quâ nullum dolorem subjiciunt vulnera?" Elliotson was roundly abused for his Harveian Oration in *The Lancet* for 4 July 1846.

Interesting details concerning James Esdaile are given by Ellis, who records that he went out to India to a hospital at Hooghly near Calcutta where he began to practise mesmerism. In 1845 he performed a major operation successfully, the patient coming out of his trance thirteen hours later. After he had operated on more than a hundred cases, he reported to the government. A committee of seven, four of whom were physicians, was appointed by Sir Herbert Maddock, the Governor of Bengal, to investigate the situation. They reported favourably, and in 1846 a small hospital was put at Esdaile's disposal for a year. Here he operated upon many cases with varying success, inductions lasting from half an hour to nearly a fortnight. Another very favourable report appeared at the end of the year, stating that shock during procedures under mesmerism was greatly reduced; but there were also many failures. Ether and chloroform had meanwhile come into use, but he persevered with mesmerism because he thought the drugs more dangerous. Lord Dalhousie, the new Governor-General, took a great interest in Esdaile and had him appointed Residency surgeon. In all, he performed 261 operations under mesmerism with a mortality of 5.5 per cent. He left India in 1851 after twenty years' service. When he got back to Scotland he tried mesmerism on a few cases, but with little success. Ellis writes that Esdaile was driven to the conclusion that the Indian was a more susceptible subject than a Scot!

I. 16.

ESDAILE ON MESMERISM

London, 1846.

Title: Mesmerism in India, | and its | practical application in surgery | and medicine. | By | James Esdaile, M.D. | Civil assistant surgeon, H.C.S. Bengal. | [. . .] | London: | Printed for | Longman, Brown, Green, and Longmans, | Paternoster-Row. | 1846.

Collation: 12°. A⁸, a⁸, B-T⁸; xxxii, 287 [288] pp., 32 pp.

Contents: A_{1a} half-title; A_{1b} printer's note; A_{2a} title; A_{2b} blank; A_{3a} 'To the Rev. James Esdaile, D.D.' dated Hooghly, Feb. 1st, 1846; A_{3b} blank; A₄ Preface; A_{5a}-a_{2b} (pp. ix-xx) Editor's Preface, signed David Esdaile; a_{3a}-a_{5b} (pp. xxi-xxvi)

'Mesmeric Facts'; a6a-8a (pp. xxvii-xxxi) Contents; a8b blank; B1a-S8b (pp. 1-272) text; T1a-8a (pp. 273-287) appendix; T8b printer's note; pp. 1-32 advts.

Note: Although Esdaile had issued reports in the *Indian Journal of Medical and Physical Sciences*, this is his first formal report. It was published in June 1846 and thus coincided closely with the appearance of Elliotson's Harveian Oration. Esdaile does not here use the term 'anæsthesia.' The book was several times reprinted. An American edition with text unchanged was brought out at Hartford, Conn. (Silas Andrus and Son, xxvi,[27]-259 pp.) in 1847 and again in 1851. Much rarer is a volume which he had printed at Perth in 1852 under the title, *The Introduction of mesmerism, as an anæsthetic and curative agent, into the hospitals of India* (Osler catalogue No. 1388).

There is no better way of introducing James Braid who did so much to clarify mesmerism in the eyes of a skeptical and abusive medical press than to quote a paragraph from J. Milne Bramwell's appreciation in *Brain* (1896, p. 115): "The following passage from an article in the *Quarterly Review* for September, 1853, shows how thoroughly Dr. Carpenter understood the importance attached by Braid to suggestions:—"The clue to the marvel [mesmerism] was soon found by Mr. Braid, in the concentrated operation of the principle of *suggestion* . . . and under the guidance of this idea, he has subsequently followed up the investigation with great intelligence, making no mystery of his proceedings, but courting investigation in every possible way.' "

I. 17.

BRAID'S NEURYPNOLOGY

London, 1843.

Title: Neurypnology; | or, the | rationale of nervous sleep, | considered in relation with | animal magnetism. | Illustrated by | numerous cases of its successful application | in the relief and cure of disease. | By | James Braid, M.R.C.S.E., C.M.W. S.&c. . . . | London: | John Churchill, Prince's Street, Soho. | Adam & Charles Black, Edinburgh. | 1843.

Collation: 8°. [a]⁸, b³, A-Q⁸, R⁵; xxii, 265[1] pp.

Contents: p.[i] half-title; p.[ii] blank; p.[iii] title; p.[iv] printer's note; pp.[v-vi] dedication to Charles Anderson, M.D.; pp. vii-x Contents; pp. xi-xii Preface; pp. 1-260 text; pp. 261-265 Index; p.[266] 'Errata et addenda.'

Note: Elliotson and Esdaile did not clearly distinguish between hysteria and hypnotism, and it remained for Braid in this and his subsequent writings on trance to place the study of hypnosis on a scientific basis. Garrison tersely de-

scribes his contribution: "Braid at first believed that the phenomena produced by professional mesmerists were due to 'collusion and illusion'; but he soon became convinced, upon experimentation, that there can be a genuine self-induced sleep brought about by a fixed stare at a bright inanimate object (Braidism). The importance of Braid's work is that he proved that the mesmeric influence is entirely subjective or personal, and that no fluid or other substance passes from the operator to the patient. This subjective trance he called neurohypnotism or hypnosis (1842). . . . Braid's view met with violent opposition, especially from the professional mesmerists, who wished to keep their exhibits upon a miraculous basis, but his ideas were taken up by Azam, Broca, Charcot, Liébeault, Bernheim, and became the true starting-point of the French school."

Copy: Dr. C. C. Fry (on loan).

Sulphuric Ether

The story of sulphuric ether dates back to its original synthesis by Valerius Cordus in the sixteenth century. Cordus, the brilliant son of the distinguished physician-botanist, Euricius Cordus, succeeded in 1540 in synthesizing "sweet vitriol" from sulphuric acid and alcohol. The description of his synthesis was published posthumously in an edition of his writings edited by Conrad Gesner and issued in 1561. The account is found in the third part (Ch. xii) of the book entitled *De artificiosis extractionibus* which has been translated into English by Guy K. Tallmadge (*Isis*, 1925, 7, 394-411).

I. 18.

CORDUS ON ETHER

Strassburg, 1561.

Title: In hoc volumine continentur | Valerii Cordi Si- | mesusij
annotationes in Pedacij | Dioscoridis Anazarbei de medica
materia libros V . . . | Eiusdem Val. Cordi historiae stirpium
lib. IIII. post- | humi . . . | De artificiosis extractionibus liber.
| . . . | Omnia summo studio . . . Conr. Ges- | neri . . . collecta,
& præfationibus illustra. | [Printer's mark: I. Rihelius of
Strassburg] | . . . | M. D. LXI.

Collation: Folio. a-b⁴, A-O⁶, P-Z⁴, a-z⁴, Aa-Zz⁴, AA⁶; 8 ll., 302 foliated ll., 7 ll.

Contents: see Note.

Note: This is too complex a book for detailed contents. The section on the synthesis of ether ("sweet oil of vitriol") occurs in the third part of the book which begins on folio 225 (Dd2a) entitled "De artificiosis extractionibus liber"; Part III, Chap. I, headed "De oleo vitrioli faciendo" begins on folio 226 verso (Dd3b) and

ends on folio 229 recto (Ee2a). This text has many errors which were corrected in Peter Coudenberg's 2nd edition of *Cordus* published in 1571, and it was from the corrected text that the Tallmadge translation was made. Attention should also be directed to Chauncey Leake's excellent account of *Cordus* (*Isis*, 1925, 7, 14-24). *Cordus* was vaguely aware of the properties of ether and left this interesting description:

"*The properties of the substance which has been separated.* It has all of the properties of sulphur, but all of them are more pronounced because it penetrates liquids more easily, and hastens actions, which sulphur cannot do because it is impeded by its own solidity and dryness, by which it is less penetrating. This, indeed, this oil can do better than sulphur, wherefore it is especially valuable for all putrefactions in the body, and particularly for the plague. It draws the pus and mucus from the lung in pleurisy, peripneumonia, and hacking cough, for it may be securely taken internally, and without any danger. It does not cause stones to form, either in the kidneys or in the urinary bladder; it heals an excoriated urinary bladder. Its dose is one or two drops, or three mixed in a moderate quantity of wine. It may be mixed, moreover, into pills and electuaries made of sugar. It must be carefully preserved, however. For only a little is got from a pound of sour oil of vitriol, and because of the tenuity of its nature it easily evaporates."

Sweet vitriol was known to chemists from that time on; Robert Boyle again synthesized it and gives a clear description in a tract entitled *Experiments and notes about the producibleness of chymicall principles* appended to the second edition of the *Sceptical chymist* (1680, p. 110). Sir Isaac Newton likewise synthesized ether using Boyle's procedure. Thus in the *Optics* (1704, Bk. III, Question 31; 2nd Ed., 1717, p. 359) he wrote: "And so, when an equal weight of Spirit of Wine and Oil of Vitriol are digested together, and in Distillation yield two fragrant and volatile Spirits which will not mix with one another, and a fix'd black Earth remains behind; doth not this shew that Oil of Vitriol is composed of volatile and fix'd Parts strongly united by Attraction, so as to ascend together in form of a volatile, acid, fluid Salt, until the Spirit of Wine attracts and separates the volatile Parts from the fixed? . . ." It was once more synthesized in 1730 by the German chemist, Frobenius, who gave it the name of sulphuric "æther."*

Then appeared an important but little-known tract on ether by Matthew Turner, the teacher of Joseph Priestley. There-

* Johannes Augustus Sigmundus Frobenius, M.D., F.R.S. (d.1741) appears to have been a German chemist who had worked in Robert Boyle's laboratory along with Ambrose Godfrey Hanckewitz, F.R.S. (d.1741), chemist and 'operator' in Boyle's chemical laboratory (*Dict. Nat. Biog.*, 8, 30). When Frobenius'

after little was added to our knowledge of the basic chemistry of ether until John Dalton's memoir on sulphuric ether which appeared in 1820.

I. 19.

MATTHEW TURNER ON ÆTHER

London [?1743].

Title: An | account | of the extraordinary | medicinal fluid, | called Æther. | [rule] | By M. Turner, Surgeon, | in | Liverpool. | [rule] | [ornament] | London: | Printed by J. Wilkie, at the Bible in St. Paul's Church-yard. [Fig. 2]

Collation: 8°. [3], 4-16 pp. [no signatures].

Contents: p.[1] title; p.[2] publisher's statement; p.[3]-16 text.

Note: Matthew Turner is described in the *Dictionary of National Biography* as one of the remarkable group of Manchester literary figures who founded the Warrington Academy. According to McLachlan (*English education under the Test Acts*, 1931), "A course of lectures on Chemistry at the Academy by Dr. Matthew Turner of Liverpool in 1763, given on Priestley's suggestion, directed his [Priestley's] attention to a subject in which he was to make subsequent discoveries. This course was repeated and given a place in the curriculum." Turner was a chemist of rare acumen. He alludes to the fact that Isaac Newton was familiar with ether, also Robert Boyle, but that they did not call it by its modern name. In a brief paragraph he then describes how ether is made:

"It is a kind of Ethereal Oil, produced by the Decomposition of the Vinous Spirit by Means of the Vitriolic Acid, and differs essentially both from Vinous Spirits and Essential Oils in several Respects, tho' it agrees with them in some, as will appear hereafter: But as the Vinous Spirit may be decomposed by means of all the three Mineral Acids, viz., the *Vitriolic*, the *Nitrous* and the *Marine*, and as these all act differently on the Spirit, they will, of Course, produce three different Kinds of ÆTHER; which, from the Name of the Acid employ'd in making them, are term'd *Marine*, *Nitrous*, or *Vitriolic*: The last only is the Kind here understood, it's Properties being more singular and extraordinary, and, as an ÆTHER, more perfect than either of the others; the Reason of which seems to be, that the *Vitriolic Acid* is a much stronger Agent on the Spirit, and more perfectly decomposes it, than either the *Nitrous* or *Marine*."

Turner recommends ether by ingestion, generally two teaspoons taken in wine, but in his directions for using ether in headache he adds: "In stubborn Cases it will likewise be serviceable to snuff a little of the ÆTHER up the Nostrils, either alone or mixed with equal Parts of Lavender Water, *Hungary* Water, or Brandy; or it may be more convenient to apply a bit of Linen Rag, wetted

paper was published ("An account of a spiritus vini æthereus, together with several experiments tried therewith," *Philos. Trans. Roy. Soc.*, 1730, 36, 283; Abridg., 1734, 1, 744-747). Hanckewitz accused him of having stolen the Boyle synthesis. It appears that Hanckewitz (who usually went under the name of Ambrose Godfrey) had been making ether and dispensing it for some years before Frobenius' paper appeared. By some the name Frobenius was thought to be a *nom-de-plume* (Wotton, *Chronicles of pharmacy*, 1910, 1, 347), but this had been disproved by Kopp (*Geschichte der Chemie*, 1847, 4, 302).

AN
ACCOUNT
OF THE EXTRAORDINARY
MEDICINAL FLUID,
CALLED
ÆTHER.

By M. TURNER, SURGEON,

IN

LIVERPOOL.



L O N D O N .

Printed by J. WILKIE, at the Bible in St. Paul's Church-yard.

FIG. 2. Title-page of Turner, on Æther

with ÆTHER, up the Nostrils. Any of these Means, or all of them, must be repeated if the Pain is so urgent as to require it." So Turner looms large in our story, for he had used ether by inhalation to relieve pain. How nearly he came to taking the great step which Morton took one hundred years later!

Finally, Turner not only recommended the use of ether, but he made and dispensed it, as is indicated in the last paragraph of the pamphlet:

"The ÆTHER that has the foremention'd Properties (for there are 'Preparations sold by the same Name, which are very imperfect Imitations of it) is made and sold by M. Turner, Surgeon, in *Liverpool*. The Ounce Phial *two Shillings*; the Half Ounce *one Shilling*. The Phials are square; the Word ÆTHER inscribed on one Side, and M. TURNER on the opposite, and sealed with a Lion gardant, &c. Proper Abatement will be made to Druggists, Apothecaries, or the Gentlemen of the Faculty who use any considerable Quantity. To prevent it's escape and loss, a small Quantity of Water is put into each Phial, which should be kept with the Cork downwards, by which Means the ÆTHER is prevented, by the interposition of the Water, from evaporating."

I. 20.

DALTON ON SULPHURIC ETHER *Manchester*, 16 April 1819.

Title: Memoir on sulphuric ether. By John Dalton. *Annals of Philosophy*, Feb. 1820, 15, 117-133. (Issued also in *Memoirs and Proceedings, Manchester Literary and Philosophical Society*, 1820, n.s. 3, 446-482.

Note: Although Dalton had studied ether in 1805, this is the classic paper on the chemistry and physical properties of sulphuric ether. Henry in his *Dalton Memoirs* (London, 1854) says of it: "He describes the modes he employed to separate ether from the alcohol, which passes over with it in distillation, and which seems to have been sufficiently careful. For he obtained an Ether of the same specific gravity .720, and the same boiling point 95° or 96°, as are now assigned to that fluid. By an earlier experiment in 1805, he had deduced for the specific gravity of its vapour the number 2.65, a fair approximation to 2.586, the number now received. But in this memoir he 'thinks 3.1 is probably the nearest expression in two places of figures that can be obtained.' . . . He performed the analysis of ether by firing its vapour mixed with oxygen, in the proportion of not more than 3 to 10 per cent. of the volume of oxygen, in a Volta's eudiometer. 'This method,' he observes, 'I discovered in September 1803, and have used it occasionally ever since.'"

The effects of inhaling ether were mentioned by a number of writers prior to Jackson and Morton. Davy and Beddoes had inhaled ether fumes and in an anonymous note published in 1818 in the *Quarterly Journal of Science and the Arts* the effects of inhaling sulphuric ether are described in some detail. This note is generally attributed to Michael Faraday, although to our knowledge there is no certain proof that he was actually the author. Faraday at this time was twenty-six years of age. The account runs:

When the vapour of ether mixed with common air is inhaled, it produces effects very similar to those occasioned by nitrous oxide. A convenient mode of ascertaining the effect is obtained by introducing a tube into the upper part of a bottle containing ether, and breathing through it; a stimulating effect is at first perceived at the epiglottis, but soon becomes very much diminished, a sensation of fulness is then generally felt in the head, and a succession of effects similar to those produced by nitrous oxide. By lowering the tube into the bottle, more of the ether is inhaled at each inspiration, the effect takes place more rapidly, and the sensations are more perfect in their resemblance to those of the gas.

In trying the effects of the ethereal vapour on persons who are peculiarly affected by nitrous oxide, the similarity of sensation produced was very unexpectedly found to have place. One person who always feels a depression of spirits on inhaling the gas, had sensation of a similar kind produced by inhaling the vapour.

It is necessary to use caution in making experiments of this kind. By the imprudent inspiration of ether, a gentleman was thrown into a very lethargic state, which continued with occasional periods of intermission for more than 30 hours, and a great depression of spirits; for many days the pulse was so much lowered that considerable fears were entertained for his life.

According to H. M. Lyman,* who published a scholarly volume on anesthesia in 1881, William E. Clarke, a chemistry student of Rochester, New York, began to entertain his friends by offering them ether to inhale, much as Englishmen pass after-dinner snuff. In 1842, having continued these entertainments for three years, he administered ether vapor from a towel to a friend, Miss Hobby, while his associate, Elijah Pope, extracted a tooth painlessly. Ether frolics and laughing-gas parties, as they came to be called, began to have such wide popularity that they were in large measure responsible for suggesting to Wells, Long, and Morton the possibilities of surgical anesthesia.

* Lyman, H. M. *Artificial anæsthesia and anæsthetics*. New York, W. Wood & Co., 1881. vii, 338 pp. [see p. 6].

II. CRAWFORD WILLIAMSON LONG

CRAWFORD W. LONG of Jefferson, Georgia, had become familiar with ether frolics while a student at the University of Pennsylvania. In January 1842 a group of his friends induced him to have an evening nitrous-oxide frolic in his room. When it transpired that no nitrous oxide was available in the town that evening, Long informed them that ether would do as well. So the party proceeded to inhale the ether and had an hilarious evening; and there were a number of cuts and bruises, none of which had been felt. From this Long concluded that ether must abolish pain. Two months later (30 March 1842), with his recent ether frolic in mind, he administered sulphuric ether to a Mr. James Venable and removed a small cystic tumor from the back of his neck. The patient later testified that he experienced no pain and a second operation, involving the removal of another small tumor from the gentleman's neck, was performed by Long on 6 June 1842. On 3 July 1842 Long amputated the toe of a negro boy named Jack. On 9 September 1843, an encysted tumor was removed from the head of Mrs. Mary Vincent. A fifth operation was carried out on 8 January 1845 (amputation of the finger). Three other surgical procedures were undertaken before September 1846, making a total of eight. Long's experience with ether was not published until December 1849, when—as a result of the controversy that had arisen over Morton's claims—he contributed a short paper to the *Southern Medical and Surgical Journal*. A further statement was presented in 1853 before the Medical Society of the State of Georgia, but this was not published at the time.

Original Papers

II. 1.

FIRST USE OF SULPHURIC ETHER

Augusta, Ga., 1849.

Title: An account of the first use of sulphuric ether by inhalation as an anæsthetic in surgical operations. By C. W. Long,

M.D., of Jefferson, Jackson Co., Georgia. *Southern Medical and Surgical Journal*, December 1849, *n.s.* 5, 705-713.

Note: Although not published until 1849, this paper with its testimonial certificates from James Venable and other patients who received ether anesthesia in 1842, four years before Morton, establishes Long's claim to priority in the use of ether. It has been many times reprinted, *i.e.*, by Boland, Buxton, Young (1942), and others (see below for references).

II. 2.

SECOND PAPER ON ETHER

Augusta, 1853.

Title: [Statement of claims to priority of discovery of the anesthetic properties of sulphuric ether.]

Note: This paper, which was read on 13 April 1853, is referred to in the *Southern Medical and Surgical Journal* (1853, *n.s.* 9, 384) and also in the *Transactions of the Medical Society of Georgia* (1853, p. 6), but it was not published at the time. Hugh Young issued the full text (without title) in 1896 as an appendix to a paper on Long published in the *Johns Hopkins Hospital Bulletin*. After hearing Long's paper read in 1853, a committee of the Medical Society of the State of Georgia adopted the following resolution (*Trans. med. Soc. Georgia*, 1853, p. 7):

"Resolved, That it is the opinion of the society that Dr. Crawford W. Long, of Athens, Geo., was the first person who used Sulphuric Ether as an Anæsthetic Agent, in surgical operations; and as an act of justice to Dr. Long, individually, and to the honor of the profession of our own State, we recommend him to present his claims, to priority in the use of this most important agent, to the consideration of the American Medical Association at its next meeting."

Long's story was issued modestly and with an apology for not having told it earlier. On the basis of it, no one can take issue with Welch who remarked in his Ether Day Address (1908): "Long is necessarily deprived of the larger honor which would have been his due had he not delayed publication of experiments with ether until several years after the universal acceptance of surgical anæsthesia. . . . We need not withhold from Dr. Long the credit of independent and prior experiment and discovery, but we cannot assign to him any influence upon the historical development of our knowledge of surgical anæsthesia or any share in its introduction to the world at large." It is certainly true that no physician or surgeon ever used ether because Long had used it, "nor did mankind learn from him that anæsthetic inhalation for surgical purposes was possible" (Hodges).

Biography and Commentary

II.

3. BOLAND, F. K. Crawford William Long and the discovery of anæsthesia. *Georgia hist. Quart.*, 1923, 7, 135-154.
4. BUXTON, D. W. Crawford William Long (1815-1879): the pioneer of anæsthesia and the first to suggest and employ ether inhalation during surgical operations. *Proc. R. Soc. Med.*, 1912, 5 (Sect. Anæsth.), 19-45.
5. CHILES, Rosa P. Dr. Crawford W. Long, discoverer of anæsthesia. *Munsey's Mag.*, 1911, 45, 623-630.
6. FULTON, J. F. Crawford William Long (Nov. 1, 1815-June 16, 1878). *Dictionary of American Biography* (New York, Scribners), 1933, 11, 374-376.
7. GOSS, I. H. Long and his discovery. *Journal-Record of Medicine*. November 1908, 8 pp.
8. JACOBS, Joseph. *Some personal recollections and private correspondence of Dr. Crawford Williamson Long . . . together with documentary proofs of his priority in this wonderful discovery*. Atlanta, Ga., 1919. 47 pp.
9. PENNSYLVANIA. UNIVERSITY. Memorial to Dr. Crawford W. Long, of the class of 1839, medical. . . . An account of the ceremonies of the unveiling of a bronze medallion in the medical building on March 30, 1912, to the memory of Crawford W. Long, who first used ether as an anæsthetic in surgery on March 30, 1842. Philadelphia, Published by the University, 1912. 15 pp. (From its Bulletins, 12th ser., no. 4, pt. 8.)
10. RAPER, H. R. A review of the Crawford W. Long centennial anniversary celebrations. *Bull. Hist. Med.*, 1943, 13, 340-356.
11. SIMS, J. Marion. The discovery of anæsthesia. Richmond, J. W. Fergusson & Son, 1877. 20 pp. (Reprint from *Virginia med. Month.*, May 1877.)
12. — History of the discovery of anæsthesia. Richmond [Va.], 1877; New York, 1879. 14 pp. (Reset from *Virginia med. Month.*, May 1877.)
13. TAYLOR, Frances Long. *Crawford W. Long and the discovery of ether anæsthesia. With a foreword by Francis R. Packard*. New York, P. B. Hoeber, 1928. xiii, 237 pp.
14. U. S. 69th Congress. 1st session, 1925-1926. *Crawford W. Long. Proceedings in Statuary Hall of the United States Capitol upon the unveiling and presentation of the statue of Crawford W. Long by the State of Georgia. March 30, 1926*. Washington, Government Printing Office, 1926. v, 69 pp.
15. YOUNG, H. H. Long, the discoverer of anæsthesia. A presentation of his original documents. *Johns Hopk. Hosp. Bull.*, 1897, 8, 174-184.
16. — Crawford W. Long, discoverer of ether anæsthesia. *Hygeia*, 1926, 4, 380-383.
17. — Crawford W. Long: the pioneer in ether anæsthesia. *Bull. Hist. Med.*, 1942, 12, 191-225.

III. HORACE WELLS AND NITROUS OXIDE

THE claims of Horace Wells of Hartford, Connecticut, to priority as the discoverer of anesthesia are most impressive, not alone because of the dignified way in which they were set forth (both by Wells himself and by his supporters such as the Honorable Truman Smith), but because they leave little doubt that Wells had grasped the concept of inhalation anesthesia by December 1844 and perhaps even earlier, and that during 1845 he gave ether (once) and nitrous oxide (on a number of occasions) for tooth extraction. There seems to be no question that Wells had passed such information as he had on to W. T. G. Morton with whom he had a brief partnership. In addition to this, Wells made a serious attempt to convince the world that he had made a discovery; and had the world listened, his claim over Morton would certainly be valid. Some feel that even so it *is* valid (see Archer, Soifer, Steiner and others listed below).

The story of his first extraction is simple and yet dramatic. On the evening of 10 December 1844 Gardner Q. Colton, a New York inventor and showman, gave a public demonstration of the effects of "laughing gas" at Union Hall in Hartford, Connecticut. Sam Cooley, a drugstore clerk who was seated beside Horace Wells, volunteered to take the gas, and while under its influence injured his knee severely, but he was unaware of the accident until the effects of the nitrous oxide had passed off. Wells, the alert young dentist, put two and two together and the next morning (11 December) persuaded his colleague, Dr. John M. Riggs, to extract one of his (Wells') teeth under nitrous oxide. On recovery from the gas Wells exclaimed: "It is the greatest discovery ever made. I didn't feel as much as the prick of a pin."

Wells satisfied himself that the nitrous oxide could be used safely and proceeded to demonstrate it at Boston to Morton, his former student and partner in Hartford. John Collins Warren permitted Wells to administer the gas to a boy for tooth extrac-

tion before a class at the Harvard Medical School (in January 1845). Unfortunately the level of anesthesia was too light and the boy screamed out, and Wells was consequently proclaimed a visionary and a charlatan. He returned home discouraged and after making several half-hearted attempts to use nitrous oxide he abandoned his dental practice. Following Bigelow's announcement he attempted to establish his priority in letters to the *Hartford Courant*, the Paris Academy of Medicine, and the *Boston Medical and Surgical Journal* (12 May 1847, 36, 298-301; 24 June 1847, 36, 421-422). He also went to Paris where he received an indifferent hearing. Finally, after further episodes of frustration he committed suicide (24 January 1848). Colton revived the use of nitrous oxide in dentistry in New Haven in June 1863 when he taught the distinguished local dentist, Dr. J. H. Smith, how to use it.

Original Papers

III. 1.

AN ESSAY ON TEETH

Hartford, 1838.

Title: An essay | on | teeth; | comprising a brief description | of their | formation, diseases, | and | proper treatment. | By Horace Wells, | surgeon dentist. | Hartford. | Printed for the author, | by Case, Tiffany & Co., Pearl-Street, | 1838.

Collation: 12°. 1 l., vi [vii-viii], [13]-70 pp., 1 l.

Contents: 1 l. blank; p.[i] title; p.[ii] blank; p.[iii] dedication 'To my brother, Charles Wells, M.D.'; p.[iv] blank; pp.[v]-vi Advertisement; p.[vii] Contents; p.[viii] blank; pp.[13]-70 text.

Note: This small volume, published when its author was twenty-three years of age, is a creditable work, and it is significant in the story of anesthesia since he discusses toothache and dental pain in general, and ways and means of alleviating them.

III. 2.

WELLS' INITIAL CLAIM

Hartford, 7 Dec. 1846.

Title: [Letter beginning 'Mr. Editor,' dated 'Hartford, Dec. 7, 1846' and signed 'Horace Wells, Surgeon Dentist.'] *Hartford Courant*, 9 December 1846. [Fig. 3]

Note: The text of this important letter is given in full by Archer in his *Chronological history of Horace Wells* (1939) and also in his *Life and letters of Horace Wells* (1944). Wells records that after his unsuccessful demonstration of nitrous

HARTFORD, Dec. 7, 1846.

Mr. Editor:—You are aware that there has been much said of late respecting a gas, which, when inhaled, so paralyzes the system as to render it insensible to pain. The Massachusetts General Hospital have adopted its use, and amputations are now being performed without pain. Surgeons generally throughout the country, are anxiously waiting to know what it is, that they may make a trial of it, and many have already done so with uniform success. As Drs. Charles T. Jackson and W. T. G. Morton, of Boston, claim to be the originators of this invaluable discovery, I will give a short history of its first introduction, that the public may decide to whom belongs the honor.

While reasoning from analogy, I was led to believe that the inhaling of any exhilarating gas, sufficient to cause a great nervous excitement, would so paralyze the system as to render it insensible to pain, or nearly so; for it is well known, that when an individual is very much excited by passion, he scarcely feels the severe wound, which may at the time be inflicted, and the individual who is said to be "dead drunk," may receive severe blows, apparently without the least pain, and when in this state, is much more tenacious of life than when in the natural state. I accordingly resolved to try the experiment of inhaling an exhilarating gas myself, for the purpose of having a tooth extracted. I then obtained some nitrous oxide gas, and requested Dr. J. M. Riggs to perform the operation at the moment when I should give the signal, resolving to have the tooth extracted before losing all consciousness. This experiment proved to be perfectly successful—it was attended with no pain whatever. I then performed the same operation on twelve or fifteen others with the same results.

I was so much elated with this discovery, that I started immediately for Boston, resolving to give it into the hands of proper persons, without expecting to derive any pecuniary benefit therefrom. I called on Drs. Warren and Haywood, and made known to them the result of the experiments I had made. They appeared to be interested in the matter, and treated me with much kindness and attention. I was invited by Dr. Warren, to address the Medical Class upon the subject, at the close of his lecture. I accordingly embraced the opportunity, and took occasion to remark that the same result would be produced, let the nervous system be excited sufficiently by any means whatever; that I had made use of nitrous oxide gas or protoxide of nitrogen, as being the most harmless. I was then invited to ad-

minister it to one of their patients, who was expecting to have a limb amputated. I remained some two or three days in Boston for this purpose, but the patient decided not to have the operation performed at that time. It was then proposed that I should administer it to an individual for the purpose of extracting a tooth. Accordingly a large number of students, with several physicians, met to see the operation performed—one of their number to be the patient. Unfortunately for the experiment, the gas bag was by mistake withdrawn much too soon, and he was but partially under its influence when the tooth was extracted. He testified that he experienced some pain, but not as much as usually attends the operation. As there was no other patient present, that the experiment might be repeated, and as several expressed their opinion that it was a humbug affair, (which in fact was all the thanks I got for this gratuitous service,) I accordingly left the next morning for home.—While in Boston, I conversed with Drs. Charles T. Jackson and W. T. G. Morton, upon the subject, both of whom admitted it to be entirely new to them. Dr. Jackson expressed much surprise that severe operations could be performed without pain, and these are the individuals who claim to be the inventors. When I commenced giving the gas, I noticed one very remarkable circumstance attending it, which was, that those who sat down resolving to have an operation performed under its influence, had no disposition to exert the muscular system in the least, but would remain quiet as if partially asleep. Whereas, if the same individuals were to inhale the gas under any other circumstances, it would seem impossible to restrain them from over exertion.

I would here remark, that when I was deciding what exhilarating agent to use for this purpose, it immediately occurred to me that it would be best to use nitrous oxide gas or Sulphuric Ether. I advised with Dr. Marcy, of this city, and by his advice I continued to use the former, as being the least likely to do injury, although it was attended with more trouble in its preparation. If Drs. Jackson and Morton, claim that they use something else, I reply that it is the same in principle if not in name, and they cannot use any thing which will produce more satisfactory results, and I made those results known to both of those individuals more than a year since.

After making the above statement of facts, I leave it for the public to decide to whom belongs the honor of this discovery.

Yours truly,

HORACE WELLS, Surgeon Dentist

Fig. 3. Text of Horace Wells' first claim as it appeared in the *Hartford Courant* for 9 December 1846

(Courtesy of the *Hartford Courant*)

oxide in Boston in January 1845, "I conversed with Drs. Charles T. Jackson and W. T. G. Morton upon the subject, both of whom admitted it to be entirely new to them. Dr. Jackson expressed much surprise that severe operations could be performed without pain, and these are the individuals who claim to be the inventors."

Toward the end of December 1846, Wells, on learning that Jackson and Morton were both making claims of priority in the discovery of anesthesia, decided to go to France to present his case in person. It is not clear how much of a hearing he was given, but both the Académie Royale de Médecine and the Académie des Sciences published extracts from his letter in their proceedings. He also issued a letter in a Paris news sheet. Since these are all much the same, they are grouped in a single entry.

III. 3.

WELLS' FRENCH CLAIMS

Paris, Feb. 1847.

Title: [Letter to L'Académie Royale de Médecine.] *Bulletin de l'Académie Royale de Médecine*, 23 February 1847, 12, 394-396.

Note: A well-phrased letter presented at the meeting of 23 February asking the Academy to pass judgment upon his claim to priority in the discovery that inhalation of various volatile substances caused insensibility to pain. The letter to the Académie des Sciences was published in their *Comptes Rendus* for 8 March 1847 (pp. 372-373); in the discussion that followed its presentation Élie de Beaumont reiterated Jackson's claims (see p. 66) which had been presented several weeks earlier. A more popular account was published at Paris in *Galignani's Messenger* for 17 February 1847 (reprinted in English in the Boston *Atlas* for 2 April 1847, columns 2 and 3 of page 2). The letter and its English translation are both reproduced in the Hickman Souvenir volume issued in 1930 by the Wellcome Historical Medical Museum (see I.12, p. 14).

Wells had gone to France without sworn testimonials and by many he was looked upon as a young imposter; consequently as soon as he returned to Hartford the last week in March he quickly collected his testimonials and within a week had them printed in the following volume. His ship must have arrived in Boston on 22 or 23 March (since he had not sailed from Liverpool until 4 March and since his Boston testimonials are all dated 23 March—including that from John Collins Warren). He collected more in Hartford on the 25th, 26th, and 27th, and published his brochure on the 30th.

HISTORY OF THE DISCOVERY
OF THE APPLICATION OF
NITROUS OXIDE GAS,
ETHER, AND OTHER VAPORS,
TO
SURGICAL OPERATIONS.

BY HORACE WELLS.

HARTFORD:
J. GAYLORD WELLS,
CORNER MAIN AND ASYLUM STS.
1847.

FIG. 4. Title-page of Wells, on Nitrous Oxide Gas

III.4.

HISTORY OF NITROUS OXIDE

Hartford, 1847.

Title: A | history of the discovery | of the application of | nitrous oxide gas, | ether, and other vapors, | to | surgical operations. | [rule] | By Horace Wells. | [rule] | Hartford: | J. Gaylord Wells, | Corner Main and Asylum Sts. | 1847.

Collation: 12° (18.4 cm.). 25 pp.

Contents: p.[1] title; p.[2] blank; p.[3] Preface, dated 'Hartford, March 30, 1847'; p.[4] blank; pp.[5]-14 text; pp.[15]-25 'Testimony'; p.[26] blank.

Note: This is Horace Wells' only separate publication on anesthesia. His preface tells the story:

"In answer to a request, made by several scientific and medical societies of Europe, who have desired me to furnish them with the evidence of my priority of discovery of the application of gas, or vapor, for the performance of surgical operations, I have obtained testimonials and affidavits sufficiently numerous and satisfactory, as I believe, to establish the fact beyond a doubt.

"I have forwarded the original papers to Dr. C. S. Brewster, of Paris, (No. 11 Rue de la Paix), who will have charge of them until this question is settled.

"The following pages contain a correct copy of those papers, which prove, conclusively, that I made known this discovery in November [actually 11 December], 1844, which date is nearly two years prior to that given by Drs. Jackson and Morton."

Biography and Commentary

III.

5. AMERICAN DENTAL ASSOCIATION. Horace Wells centenary celebration, Hartford, Conn., December 11, 1944. [Hartford, 1944.] (Three pieces issued at time of celebration.)

6. ARCHER, W. H. Chronological history of Horace Wells, discoverer of anesthesia. Pittsburgh, A. R. Plantz, 1939. 18 pp. (Printed without illus. in *Bull. Hist. Med.*, 1939, 7, 1140-1169.)

7. — Historical notes on Horace Wells. *Dent. Rays*, 1939, 14, 71-77.

8. — Letters of Dr. and Mrs. Horace Wells discovered. *Dent. Rays*, 1940, 15, 27-33.

9. — Life and letters of Horace Wells, discoverer of anesthesia; chronologically arranged with an appendix. *J. Amer. Coll. Dent.*, 1944, 11, 81-210. (Appendix II, 16 pp., n.p., n.d.)

10. CONNECTICUT STATE MEDICAL JOURNAL. Horace Wells centenary number Nov. 1944, 8, 725-802.

11. *Discovery of anesthesia by Dr. Horace Wells; memorial services at the fiftieth anniversary.* Philadelphia, Patterson & White, 1900. 124 pp.

12. *Dr. Wells, the discoverer of anæsthesia.* New York, J. A. Gray, 1860. 15 pp.

13. — Hartford, Case, Lockwood & Brainard, 1870. 16 pp.

13a. ERVING, H. W. The discoverer of anæsthesia: Dr. Horace Wells of Hartford. *Yale J. Biol. Med.*, 1933, 5, 421-430.

14. FULTON, J. F. Gardner Quincy Colton (Feb. 7, 1814-Aug. 9, 1898). *Dictionary of American Biography* (New York, Scribners), 1930, 4, 321-322.

15. — Horace Wells (Jan. 21, 1815-Jan. 24, 1848). *Ibid.*, 1936, 19, 640-641.
16. JACOBS, W. H. Horace Wells. *Conn. St. med. J.*, 1944, 8, 729-735.
17. — Horace Wells. *Dent. Cosmos*, 1935, 77, 854-864.
18. — Horace Wells and the Hall of Fame. *Dent. Outlook*, 1941, 28, 556-558.
19. [SMITH, Truman.] *Anæsthesia! The greatest discovery of the age! Who is entitled to the credit of it?* [New York, 1859?] 16 pp.
20. — *An examination of the question of anæsthesia, arising on the memorial of Charles Thomas Wells, presented to the United States Senate, second session, thirty-second Congress.* [Washington, 1853?] 103 pp.
21. — — New-York, J. A. Gray, 1858. viii, 5-135 pp.
22. — — New-York, J. A. Gray, 1859. viii, [5]-154 pp.
23. — *An inquiry into the origin of modern anæsthesia.* Hartford, Brown and Gross, 1867. 165 pp.
24. SOIFER, M. E. Discoverers (?) of anesthesia: the claimants. *J. Amer. dent. Ass.*, 1942, 29, 1601-1607.
25. STEARNS, H. P. *The discovery of modern anæsthesia: a critique.* Hartford, Case, Lockwood & Brainard, 1876. 15 pp.
26. STEINER, W. R. Horace Wells and his discovery of anesthesia. *J. Conn. St. med. Soc.*, 1938, 2, 525-526.
27. [TOUCEY, Isaac.] *Discovery by the late Dr. Horace Wells of the applicability of nitrous oxyd gas, sulphuric ether and other vapors in surgical operations, nearly two years before the patented discovery of Drs. Charles T. Jackson and W. T. G. Morton.* Hartford, Case, Tiffany & Co., 1850. 38 pp.
28. — — Hartford, E. Geer, 1852. 40 pp.
29. WELLS, C. J. Horace Wells. *Anesth. Analges.*, 1935, 14, 176-189; 216-224.
30. WELLS, E. A. Horace Wells. *Boston med. surg. J.*, 1925, 192, 262-265.

IV. WILLIAM T. G. MORTON, HENRY J. BIGELOW, AND EDWARD WARREN

(The Introduction of Surgical Anesthesia)

MORTON gave his first public demonstration of the value of ether in a surgical operation carried out by John Collins Warren at the Massachusetts General Hospital on 16 October 1846. It was repeated on a second case the next day. Both demonstrations were highly successful, but owing to Morton's initial unwillingness to disclose the nature of his new agent and because he wished to patent it, no further trial was permitted for a period of three weeks. Henry J. Bigelow, a rising Boston surgeon, aged 28, subsequently forced the issue on 9 November at which time an amputation was performed, and Morton then authorized him to make a detailed public announcement. Actually Bigelow, at a meeting of the American Academy of Arts and Sciences on 3 November, had made a brief statement based on the first two cases, and on 9 November he told of the discovery in greater detail in a paper presented to the Boston Society of Medical Improvement. The latter report appeared in the *Boston Medical and Surgical Journal* for 18 November 1846.

The earliest printed reference to this first demonstration of ether anesthesia appeared in the Saturday issue of the *Boston Daily Journal* for 17 October, the day after the operation; a similar note appeared in the *Boston Post* of the same date (McCrillis, 1908). The notice, which Dr. Reginald Fitz believes to have been written by Albert Tenney under the guidance of Henry J. Bigelow, ran as follows:

Successful Operation. Yesterday, Dr. Morton, Dentist, No. 19 Tremont Row, at the invitation of Dr. Haywood [Hayward], visited the McLean [a misprint for Massachusetts General] Hospital, and administered his preparation to produce sleep, to a person about to undergo the operation of the extraction of a tumor from the neck. We learn from a gentleman who conversed with one of our oldest and most respected physicians who witnessed the operation, that

the success of Dr. Morton's experiment was complete. The patient sitting in a chair, with every thing made ready by Dr. Warren, who extracted the tumor, inhaled the preparation for a very brief space of time, when he fell into a quick slumber, and the surgeon proceeded to extract the tumor. The patient did not manifest the slightest symptoms of suffering, and no muscular action whatever. He appeared to be totally insensible to what was going on, till very near the close of the operation, which was quite protracted, when he drew a long sigh. It is quite as much for the interest of the surgeon as for the patient, that the preparation should be administered, for while it renders the latter insensible to the pain attending severe surgical operations, it affords the former the means of doing his work, freed from all interruptions on the part of the patient, and gives him facilities for performing operations in the most expeditious manner.

The Bigelow paper, however, of 18 November was the formal announcement of the discovery of surgical anesthesia and for that reason we list it first.

Original Announcement

IV. 1.

BIGELOW'S COMMUNICATION

Boston, 18 Nov. 1846.

Title: Insensibility during surgical operations produced by inhalation. . . . By Henry Jacob Bigelow, M.D., one of the Surgeons of the Massachusetts General Hospital. . . . *Boston med. surg. J.*, 18 Nov. 1846, 35, 309-317.

Note: This, the full text of the original announcement concerning surgical anesthesia, has been several times reprinted in full, notably in H. J. Bigelow's *Surgical Anæsthesia, Addresses and other papers* (Boston, 1900, pp. 1-16) and in Logan Clendening's *Source book of medical history* (New York, 1942, pp. 358-366). At the time no exact offprint appears to have been made. Four contemporary reprintings have been found (Nos. 2-5).

IV. 2.

DAILY ADVERTISER REPRINT

Boston, 19 Nov. 1846.

Title: [same as in No. 1].

Note: An exact reprint of the text of No. 1, with final paragraphs included, was issued by Bigelow without editorial comment in the local newsheet, the *Boston Daily Advertiser*, for 19 November 1846, p. 2.

IV. 3.

BIGELOW'S REPRINT

Boston, ? Dec. 1846.

Title: [same as in No. 1]. Reprinted with changes from *Boston med. surg. J.*, 18 Nov. 1846, 35, 309-316.

Note: This is a "reprint" of the original announcement which Bigelow had evidently had made some time after the paper appeared, for the typesetting of the reprint differs from that of the article in the *Journal*, indicating it has been reset throughout. The last seven controversial paragraphs referring to Charles Jackson and their proposed patent have been omitted; it was possibly intended for distribution abroad and was probably issued late in 1846, but the exact date has not been ascertained. It is perhaps significant that the text of the paper, abbreviated in exactly the same way, was issued on 26 December 1846 in the *Hartford Courant* (see next entry).

IV. 4.

HARTFORD COURANT'S REPRINT

Hartford, 26 Dec. 1846.

Title: [same as in No. 1, under the general heading of "Miscellaneous Selections"]. Reprinted from the text of No. 2 in the *Supplement to the Courant*. *Hartford*, Saturday, 26 December 1846, No. 26, pp. 201-203.

Note: Save for the omission of the footnote on p. 315 of Nos. 1 and 3, this follows the text of No. 3, *i.e.*, the last seven paragraphs are omitted.

IV. 5.

THE LANCET REPRINT

London, 2 Jan. 1847.

Title: Surgical operations performed during insensibility, produced by the inhalation of sulphuric ether. (Communicated by Francis Boott, M.D.). *The Lancet*, 2 January 1847, 1, 5-8.

Note: The original title was not given. Jacob Bigelow, the father of H. J. Bigelow, wrote on 28 November to Francis Boott of London telling him of Morton's discovery and enclosing the text of his son's communication as it had appeared in the *Boston Daily Advertiser*. Boott forwarded Jacob Bigelow's letter and H. J. B.'s paper to *The Lancet* which published them both in their number for 2 January 1847. Appended to the reprint was a letter from Robert Liston to Dr. Boott dated 21 December 1846 saying that on that day he had successfully used ether during an amputation at the knee, thus recording the first operation under ether anesthesia in Europe (see Cock, p. 96). Liston had learned of Bigelow's letter to Boott on Saturday, the 19th, and carried out his first operation on Monday, the 21st!

Text of Jacob Bigelow's letter (28 November 1846): "My dear Boott,—I send you an account of a new anodyne process lately introduced here, which promises to be one of the important discoveries of the present age. It has rendered many patients insensible to pain during surgical operations, and other causes of suffering. Limbs and breasts have been amputated, arteries tied, tumours ex-

tirpated, and many hundreds of teeth extracted, without any consciousness of the least pain on the part of the patient.

"The inventor is Dr. Morton, a dentist of this city, and the process consists of the inhalation of the vapour of ether to the point of intoxication. I send you the *Boston Daily Advertiser*, which contains an article by my son Henry, and which is extracted from a medical journal, relating to the discovery.

"Let me give you an example. I took my daughter Mary, last week, to Dr. Morton's rooms, to have a tooth extracted. She inhaled the ether about one minute, and fell asleep instantly in the chair. A molar tooth was then extracted, without the slightest movement of a muscle or fibre. In another minute she awoke, smiled, said the tooth was not out, had felt no pain, nor had the slightest knowledge of the extraction. It was an entire illusion.

"The newspaper will give you the details up to its date, since which other operations have been performed with uniform success."

Text of Robert Liston's letter (21 December 1846): "My dear Sir,— I tried the ether inhalation to-day in a case of amputation of the thigh, and in another requiring evulsion of both sides of the great toe-nail, one of the most painful operations in surgery, and with the most perfect and satisfactory results. It is a great matter to be able thus to destroy sensibility to such an extent, and without, apparently, any bad result. It is a fine thing for operating surgeons, and I thank you most sincerely for the early information you were so kind to give me of it."

First reference to ether in British press. This is an appropriate place to record that the earliest mention of ether anesthesia in Europe so far encountered in the literature occurs on the last page of *The Lancet* for Saturday, 26 December 1846, in a column headed "Medical News."*The note reads: "Dr. Bigelow, of Boston, United States, has recently read a paper before one of the medical societies on a process for procuring insensibility to pain during surgical operations. Teeth in large numbers have been extracted, and even limbs amputated, without pain. Such a discovery, if it stand the test of examination, will be an invaluable boon. The means used is believed to be the inhalation of the vapour of sulphuric ether for two or three minutes, which, it is stated, produces insensibility for about an equal length of time. Dr. Bigelow is reported to have patented the process on the grounds that such an agent is capable of abuse—that its action is not thoroughly understood—and because it is looked forward to as of especial use in dentistry, many of whose processes are secured by patent. Supposing the discovery to be genuine, even these offer but poor excuses for its reservation by patent."

In the 2 January 1847 number there is a favorable but cautious editorial on the new procedure and reference is made to the patent, and on the 9th further correspondence is included on the patent (pp. 49-51); on the 16th (pp. 74-75) a long and well-written editorial appears excoriating both Jackson and Morton for attempting the patent—"a stain on the whole matter. We trust it will speedily be relinquished."

* As this catalogue is passing through the press, we have discovered an earlier reference to Morton's discovery in the *London Medical Gazette* for 18 December 1846 under the title, "Animal magnetism superseded—discovery of a new hypnopoietic" (*n.s.*, 1085-1086). The statement is similar to that in *The Lancet* and evidently based on the same source, indicating that the Bigelow letter must have reached London by 16 or 17 December at the latest.

Morton's First Announcements

Although the Letters Patent bear the date of 12 November 1846, this document was not approved and ordered printed until 12 February 1847. The first printed document on anesthesia issued and signed by Morton was a single-page folded sheet addressed "To Surgeons and Physicians" stating that the "Subscriber" is prepared to furnish "a person fully competent to administer his compounds." The copy (see Fig. 5) preserved in the Library of the Massachusetts Historical Society, addressed to Dr. J. Mason Warren, bears a postmark dated 20 November [1846]. The same day Morton also published a notice in the *Boston Evening Transcript*. Some time later (? early December) he issued a testimonial circular, and the *Boston Medical and Surgical Journal* for 9 December carried still another notice in its advertising sheet headed "Morton's Letheon. General Circular. . . . Public Caution."

On advice of several of his friends, Morton had decided to apply for letters patent to secure his rights on the new discovery and from a number of suggested terms for the new drug chose the unrevealing name, "The Letheon." Enquiries poured in on him from every quarter, and to lighten the burden of correspondence he was forced to prepare a printed set of instructions. Under United States patent law he was also obliged to make public announcement of his application for letters patent, and the notice "To the Public" in the *Transcript* which he used to announce his application for patent rights was his second signed and published reference to the discovery. It is probable that the General Circular which appeared on 9 December in the *Boston Medical and Surgical Journal* was, like the notice "To Physicians and Surgeons," also issued separately, and we have reason to believe that this separate Circular, copies of which are still unlocated, was regarded by Morton as the first edition of the Letheon circular described in the next section. The notices and circulars by Morton may be listed as follows:

TO SURGEONS AND PHYSICIANS.

The subscriber is prepared to furnish a person fully competent to administer his compound to patients who are to have surgical operations performed, and when it is desired by the Operator that the patient should be rendered insensible to pain. Personal or written application may be made to

W. T. G. MORTON,

Dentist.

No. 19, Tremont Row, Boston.

FIG. 5. Morton's Notice 'To Surgeons and Physicians'

Public Notices

IV. 6.

'TO SURGEONS AND PHYSICIANS'

Boston, 20 Nov. 1846.

Title: To Surgeons and Physicians. *Signed:* W. T. G. Morton,
| *Dentist,* | No. 19, Tremont Row, Boston.

Collation: 1 leaf, folded for mailing without envelope.

Text: See figure 5.

Copies: Two copies have been traced, one in the Massachusetts Historical Society addressed to Dr. J. Mason Warren, the other at the Essex Institute, Salem, Massachusetts, addressed to Dr. Henry Wheatland, Salem, Massachusetts, postmarked "Boston, Nov. 23." The same notice appears on the back cover of the *Boston Medical and Surgical Journal* for 25 November and 2 December 1846, but Morton adds in a P.S.: "Surgeons and Physicians who may wish to witness the effect of this new agent, are respectfully invited to call at my rooms. In the next No. of the *Journal* a name for this new operation will be given." There is also a second notice by Morton on this page offering instruction in Dentistry.

IV. 7.

'TO THE PUBLIC'

Boston, 20 Nov. 1846.

Title: To the Public.

Text: "Dr. Morton, surgeon-dentist, No. 19, Tremont-street, Boston, hereby gives public notice, that letters patent have been granted by the Government of the United States for his improvement, whereby pain may be prevented in dentistical and surgical operations. He is now making arrangements to allow dentists, surgeons, and other suitable persons, to purchase licenses to use said improvement; and all persons are hereby cautioned against making any infringement on the same, if they would avoid the trouble and expense of prosecution and damages at law.

Note: Published in the *Boston Evening Transcript* for 20 November 1846. There is nothing to indicate that this was ever separately reprinted.

IV. 8.

TESTIMONIAL CIRCULAR

Boston, undated.

Title: [Original not seen; text from Bowditch (IV. 42) who refers to it as a "handbill" and hence probably a single sheet.]

Text: "Dr. Morton, dentist, No. 19, Tremont Row, Boston, has *discovered a compound* [N.B.'s italics], by inhaling which a person is thrown into a sound sleep, and is rendered insensible to pain. He has administered the compound, in his own practice, to extract teeth, and at the Massachusetts General Hospital in surgical operations, and in every case with the most complete success. The following certificates are from J. C. Warren, M.D., Professor of Anatomy and Surgery, Massachusetts Medical College; George Hayward, M.D., Professor of the Principles of Surgery and Clinical Surgery in the same institution; and C. F. Heywood, House Surgeon, Massachusetts General Hospital. The Medical College is connected with Harvard University:—

MEDICAL JOURNAL ADVERTISING SHEET.

MORTON'S LETHEON.

GENERAL CIRCULAR. The peculiar circumstances of the case, requiring that the subjoined information should be fully made known at this time, the same is now published.

PUBLIC CAUTION. Whereas Letters Patent of the United States have been duly granted for the new and valuable invention, whereby Dental and other Surgical operations may now be performed without pain or suffering, or any injurious results to the patient; and certain unprincipled persons have, in the face of Law and Justice, without any license, instructions, or authority from me whatever, used my name and attempted to pirate said invention, endangering, from their want of skill and knowledge upon the subject, the lives of those whom they have persuaded to undergo their unwarrantable experiments.

And whereas every person endeavoring without such license, instructions and authority from me, to use my name or pirate said invention, either by stealth or otherwise, and every person submitting to dental or other surgical operations, under such attempts and pretenders; or directly or indirectly aiding or abetting in any infringements of my rights secured by said Letters Patent, thereby renders himself liable in his person and property to the certain inconvenience and expense of prosecutions and damages at law.

Now therefore, on the score of humanity, as well as for the protection of my own rights, I do hereby give this public notice, and warn all persons against making my apparatus or using my said invention or name, without my free license, instructions and authority; or in any way lending themselves to the unprincipled and illegal employment of the same; as it is alike my duty and determination to hold every such offender strictly accountable in his person and estate, for all damages under the laws, and for every violation of my Letters Patent, or infringement upon my property and interests in said invention. At the same time, I would publicly announce that I am now prepared to dispose of licenses or make arrangements so that every respectable Dentist and Surgeon, or other amiable person can obtain for his patients the benefit of or secure himself full instructions and authority, to use said invention, upon just and reasonable terms; upon such terms, indeed, as must prove altogether less expensive to the purchaser, than it will probably cost him in time and money, to undertake to defend himself in the Courts for infringements on my rights in the premises—in any nothing of the dishonesty, dishonor, or disgrace, which invariably attaches itself to every individual who attempts to appropriate to himself in secret, or otherwise, that which is not only not his own, but which belongs “in LAW, EQUITY, AND IN FACT,” solely to another, his neighbor or fellow citizen.

Aware that this invention is an extraordinary one, and of very great importance, conferring as it does, a blessing heretofore unheard of upon the human race, inasmuch as by means of it, the afflicted or suffering, may now submit, without pain or injurious results, to the severest Dental and other Surgical operations, necessary for the preservation of health and life; I am particularly desirous, that my invention should not be abused, entrusted to ignorant or improper hands, or applied to nefarious purposes.

I therefore recommend that no individual should subject himself to the use of it under any operator, unless the patient learn beforehand, that such operator is really and duly licensed, instructed and authorized to administer the same, which can be ascertained in every case by merely requesting such operator to exhibit his License; and which License every one empowered to employ my apparatus and invention, possesses in writing, duly attested, under my own hand and seal.

For terms and further particulars, in regard to the Letheon, apply to 19 Tremont Row.
Boston, Nov. 26, 1846.

W. T. G. MORTON.

FIG. 6. Notice of Morton's Letheon from the rear advertising cover
of the *Boston Medical and Surgical Journal*
for 9 December 1846

'Boston, October 17, 1846.

'I hereby certify, that I have twice seen the administration of *Dr. Morton's application* for the prevention of pain; that it had a decided effect in preventing the sufferings of the patients during operation; and that no bad consequences resulted.

'J. C. WARREN.'

'On Saturday last, at the Hospital, I removed a tumor from the arm of a patient, who had immediately before inhaled something *prepared by Dr. Morton*, of this city. The operation lasted seven minutes. The patient gave no indication of suffering. She assured me afterwards she did not suffer, nor has she to the present time experienced any inconvenience from the inhalation.

'Tuesday, Oct. 20, 1846.'

'GEORGE HAYWARD.'

'I certify, that I assisted in the administration of *Dr. Morton's preparation* to two patients, operated upon by Drs. Warren and Hayward, at the Massachusetts General Hospital, on the 16th and 17th of October; that, under its influence, both these individuals submitted to operations, lasting from five to ten minutes, without suffering; and that they speedily recovered from its effects.

'Oct. 22, 1846.'

'C. F. HEYWOOD.'

'House Surgeon, Massachusetts General Hospital.'

Copies: None located; the italicized phrases were evidently those of Bowditch.

IV. 9.

'MORTON'S LETHEON'

Boston, 9 Dec. 1846.

Title: Morton's Letheon | General Circular. [two lines of text]
| Public Caution.

Text: See figure 6.

Note: Although dated 26 Nov. 1846, it did not appear in the *Boston Medical and Surgical Journal* (back cover) until 9 December. The same notice reappears in the *Journal* on 16, 23, and 30 December 1846 and again on 13 January 1847. Thereafter it lapses.

Circular. Morton's Letheon

IV. 10.

MORTON'S LETHEON [1st ed.], 1 p.

Boston, 26 Nov. 1846.

Title: [Not seen, but probably Important information for the public at large. General Circular. . . . Public Caution.]

Collation: 1-page handbill.

Note: Text probably identical with that in No. 9. Although there are various contemporary references to Morton's handbills and Public Cautions which he sent out with his correspondence, no copy of this separate has yet been traced. The text is also included in No. 12 (pp. 12-13) and in the subsequent editions of the Letheon circular.

In Rice's well-known biography of Morton (*Trials of a public benefactor*, New York, 1859, p. 114), it is stated that Mor-

ton had had printed "at his own expense and almost every week" first a letter of advice which may have reference to the "General Circular . . . Public Caution" just described, but that this later became expanded into a closely printed sheet of four pages. As with the single handbill, no copy of the latter has yet been traced, but since it probably exists we herewith make an incomplete entry:

IV. 11.

MORTON'S LETHEON [2nd ed.], 4 pp. *Boston*, [Dec.] 1846.

Note: The existence of this preliminary letter of advice is based entirely on the statement already alluded to in Rice's biography.

By the second or third week in December 1846 Morton had expanded his general one-page circular (and his four-page circular if that exists) into a 14-page sheet, also entitled "Circular. Morton's Letheon." As mentioned earlier, this was intended to assist him in replying to correspondence since the first page begins: "Dear Sir: As a general answer to your favor of [blank space] concerning the new and valuable discovery, whereby pain is prevented in Dental and other surgical operations, I hasten to transmit" [etc.].

IV. 12.

MORTON'S LETHEON [3rd ed.], 14 pp. *Boston* [Dec.] 1846.

Title: [rule] | Circular. | [ornament] | Morton's Letheon. |
[double rule] | Dutton and Wentworth, Printers | No. 37,
Congress Street, Boston.

Collation: 8°. 14 pp.; no covers.

Contents: p. 1 title; p. 2 blank; pp. 3-14 text.

Note: The Circular contains an extract from Bigelow's paper and also from that of John Collins Warren mentioned above, together with correspondence covering the period from 24 November to 7 December 1846. The assumption is therefore that the 14-page circular was issued in December 1846, probably in the second week of that month.

Copies: DSG; PPCP; PPIU-D; MBMGH (?); CtY-MHi (photostat of DSG copy).

IV. 13.

MORTON'S LETHEON [4th ed.], 42 pp. *Boston* [Jan.] 1847.

Title: [rule] | Circular. | [short rule] | Morton's Lethēon. | [double rule] | Printed by L. H. Bridgham, 6 Water Street, Boston.

Collation: 8°. 42 pp.; no covers.

Contents: p. 1 title; p. 2 blank; pp.[3]-42 text.

Note: The latest specific internal date is 30 December 1846 (on p. 34). Page 42 is unnumbered and is blank except for the significant statement: "This Circular will continue to be printed and circulated as far as shall be deemed practicable. W. T. G. Morton."

Copy: The only copy traced is in the College of Physicians, Philadelphia (photostat in Historical Library).

IV. 14.

MORTON'S LETHEON, 5th ed., 88 pp. *Boston*, May 1847.

Title: [rule] | Circular. | [tiny rule] | Morton's Lethēon. | [2 rules] | Printed by L. H. Bridgham, 6 Water Street, Boston.

Cover title: Circular | [half rule] | Fifth Edition Voice from Europe. | [half rule] | Morton's Letheon.

Collation: 8°. 4 covers, [1-3], 4-88 pp. (page numbers 15 and 16 repeated; actually 90 pp.).

Contents: Cover [1] (see above); cover [2] 'Opinions of Daniel Webster and Chas. M. Keller,' Washington, 5 Jan. 1847 and 19 Feb. 1847; cover [3] table of contents; cover 4 contents continued; p.[1] title page, p.[2] blank; pp.[3]-88 text.

Note: Rice in referring to this, the last edition of Morton's Letheon, writes: "When the news of the European success of Dr. Morton's discovery came back across the Atlantic, he changed the form of his publication, although he retained its simple title, adding to it 'A Voice from Europe.' This last edition of this valuable work, which was of nearly one hundred closely-printed pages, embodies much of great interest, and it conquered the prejudices of many who had previously had such imperfect sources of authentic information on the discovery that their minds had remained warped by prejudice, or they had been unable to form a candid opinion on the subject.

"This 'Voice from Europe,' as the fifth edition of Dr. Morton's circular was also called, acted like sunlight upon the skeptical among the American medical fraternity, and before its bright rays of truth, the darkness of prejudice was soon dissolved. Ether was immediately a universal favorite, and, strangest of all, some of those who had denounced it with the most bitterness, became not only its champion, but (in two instances) endeavored to claim the honor of suggesting its discovery to Dr. Morton."

The fifth edition of the Circular was evidently issued in fairly large numbers since many copies appear to have survived. It occurs in wrappers of three colors—yellow, green, and blue. As far as we have ascertained, the text is identical in all three and there is nothing to indicate whether one preceded the other.

Copies: An-C-MM-Os; CtHM; MBM; MBMGH; MHi; MH-M; NNC-M; NNNAM; PPCP; PPiU-D; Clendening; Trent.

Copies used (3): one in green covers, from Dr. Cushing's library; the second, in yellow covers; the third in CtY without wrappers (vol. 40, Kingsley pamphlets).

IV. 15.

U. S. LETTERS PATENT NO. 4848

12 Feb. 1847.

Title: United States Patent Office. . . . Specification forming part of Letters Patent No. 4848, dated November 12, 1846.

Collation: Single large sheet (24.5 x 16.8 cm.).

Contents: Headed by preamble: "*The United States Patent Office.*—To all persons to whom these presents shall come, greeting: This is to certify, that the annexed is a true copy upon the records of this office, of the specification of Jackson and Morton's Letters Patent, dated 12 Nov. 1846. In testimony whereof, I Edmund Burke, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto affixed, this twelfth day of February, in the year of our Lord one thousand eight hundred and forty-seven, and of the Independence of the United States the seventy-first. Edmund Burke." The text ends: "In testimony whereof, we have hereunto set our signatures this twenty-seventh day of October A.D. 1846. CHARLES T. JACKSON, WM. T. G. MORTON. *Witnesses, R. H. Eddy, W. H. Leighton.*"

Note: From the preamble it will be noted that the official seal of the U. S. Patent Office was not affixed until 12 February 1847, so the document did not become publicly available until after that time. The full text was published with acidulous editorial comment in the *Boston Medical and Surgical Journal* for 7 April 1847 (pp. 194-198) under the title, "The Patent Letheon—Jackson and Morton's Specification."

Copy: Photostat from Massachusetts Historical Society (without official seal).

Edward Warren's Letheon Tracts

One of Morton's most ardent supporters was a certain Edward Warren of Palmyra, Maine, a legal agent about whom very little appears to be known, although Rice refers to him as "Edward Warren, Esq. (a nephew of the celebrated Dr. Warren), at that time Dr. Morton's principal agent." Actually he was not a relation of J. C. Warren, nor of J. Mason Warren, nor yet of J. C. Warren's brother, Edward Warren, M.D., who published the following disclaimer in the *Boston Medical and Surgical Journal* for 21 July 1847 (pp. 506-507):*

* See Viets, H. R. The problem of the three Edward Warrens, *N. Engl. J. Med.*, 1941, 224, 1074-1076.

Note from Edward Warren, M.D. TO THE EDITOR.—Dear Sir,—I would willingly avoid all connection with the question of the discovery of the inhalation of sulphuric ether; but several articles have appeared in your valuable Journal, and in the daily papers, and a pamphlet which I have heard favorably spoken of, has been published, by a gentleman of my name, in support of the claims of Mr. Morton.

Supposing that the absence of the medical title would sufficiently distinguish the writer of this pamphlet, I have hitherto kept silent: but now, finding that it has been sent to gentlemen better acquainted with me than the author, and that I am liable to receive compliments to which I am not entitled; I think it necessary to make it known as publicly as possible that the authorship of this pamphlet does not belong to me, but to a *non-medical* gentleman connected in this business with Mr. Morton.

Having no acquaintance with Mr. M., my sympathies are entirely with my medical friend and fellow student, Dr. Jackson. It can hardly be disputed that his scientific knowledge and assiduity gave rise to the discovery. Upon these scientific attainments, I think Dr. Jackson may safely rest his claim to reputation, without being unduly anxious as to what may be derived from the discovery of ethereal inhalation.

Respectfully yours,
EDW. WARREN.

Newton L. Falls, July 15, 1847.

In the Spring of 1847, Mr. Edward Warren issued a pamphlet entitled *Some account of the Letheon; or, who was the discoverer?*, the first edition of which was precipitated by Jackson's unfortunate letter in the *Boston Daily Advertiser* for 1 March 1847. Warren was an ardent protagonist of Morton's against the claims of Charles Jackson and Horace Wells. Thus in the Preface to the second edition (dated Boston, 30 May 1847) he says:

The writer's main—indeed, his only—object has been, to state facts; to arrive at the truth; to serve the cause of justice. Most certainly, he has no selfish ends in view, having no pecuniary interests involved in the matter, receiving no remuneration whatever for his services and efforts in this behalf,* and only desirous that justice

* This is not strictly true, for at some time in the course of their association Warren was on Morton's payroll. JFF

SOME ACCOUNT
OF
THE LETHEON;

OR,
WHO WAS THE DISCOVERER?

BY EDWARD WARREN.

Boston:
DUTTON AND WENTWORTH, PRINTERS,
No. 37, Congress Street.
1847.

FIG. 7. Title-page of the first edition (38 pp.) of Edward Warren's Letheon tract

may be rendered to a person who, if he be not distinguished for his scientific attainments, is, nevertheless, a benefactor of his race!

With the learned and eminent individual who sets up counter-claims to the honor of this great discovery, the writer has been acquainted for the last ten or twelve years; and, during all that time, there have existed the most friendly relations between them. Soon after the writer's attention was called to the importance of the new discovery, he called on that gentleman; and it was the conversation that then and subsequently ensued which led to the opinion that he was not *the* discoverer, or *one* of the discoverers.

Warren employed the testimonial technique which Morton had used in his Circular, and his Letheon pamphlets in consequence contain a wealth of source material which has an important bearing on the ether controversy. The celebrated letter to Morton from Oliver Wendell Holmes appears in the second issue of the second edition of Warren's tract. As a result this has become a collector's item both for those who pursue the literature of anesthesia and for those who collect the writings of the 'Autocrat.' As with Morton's Circular, Edward Warren's tract passed through five issues but technically there were only three "editions."

IV. 16.

ACCOUNT OF LETHEON, 1st ed., 38 pp.

[March] 1847.

Title: Some account | of | the Letheon; | or, | who was the discoverer? | [short rule] | By Edward Warren. | [short rule] | Boston: | Dutton and Wentworth, Printers, | No. 37, Congress Street. | 1847. [Fig. 7]

Collation: 8°. Portrait, [1-3], 4-38 pp.

Contents: p.[1] title; p.[2] blank; portrait of Dr. Morton facing p.[3]; pp.[3]-38 text.

Note: The text, evidently composed in March of 1847, consists of series of dated letters, testimonials, and legal "disposals" from friends of Morton such as Grenville G. Hayden, William P. Leavitt, Thomas R. Spear, Jr., and Francis Whitman, purporting to establish Morton's claim to the introduction of surgical anesthesia against the claims of Charles Jackson and Horace Wells. The documents are interspersed with polemical comment, a statement by Warren and also with passages from the public and medical press, including J. Mason Warren's history of the discovery from the *Boston Medical and Surgical Journal*. The text ends about three-quarters of the way down the page (38), then below a short rule there are printed six lines, as follows:

"Letheon." Lest any one should object to this term, used at the beginning of this pamphlet, I would observe, that it is only used to avoid circumlocution. The same idea might be conveyed differently: as, for instance, "A process for the prevention of pain in surgical operations"; but the name given to the discovery in question answers the same purpose, and has the further recommendation of brevity.

Portrait: The drawing of Morton made by W. Hudson, Jr., and lithographed by J. H. Peirce occurs only in this, the first edition of the tract, and because of its quality and rarity it has been used as the frontispiece for this catalogue.

Copies: CtY-MHi (Dr. Cushing's copy, without wrappers); Clendening; MBM.

IV. 17.

ACCOUNT OF LETHEON, 2nd ed., 49 pp. [April] 1847.

Title: [Same as No. 13, with addition of "Second Edition" below author's name.]

Collation: 8°. [1-3], 4-49 pp.

Contents: p.[1] title; p.[2] blank; pp.[3]-49 text.

Note: Text pp. 1-37 identical with first edition; pp. 38-49 are made up of controversial material aimed principally at Horace Wells' *History of the discovery of nitrous oxide gas* which had been issued on 30 March 1847.

Copies: CtHM; DSG; MB; MBM; MHi; Clendening.

Copy used: Photostat from Massachusetts Historical Society.

IV. 18.

ACCOUNT OF LETHEON, 2nd ed., 79 pp. [May] 1847.

Title: [Same as No. 17].

Cover title (with filigreed border): [Same as title, save for omission of 'Second edition'].

Collation: 8°. [1-5], 4-79 pp. (*i.e.*, 81 pp.); yellow covers.

Contents: p.[1] title; p.[2] blank; pp.[3-4] Preface; 2nd p. [3]-49, line 4 as in No. 14; this is followed (pp. 49-75) by new passages, 'Dr. Jackson—how he became a discoverer,' etc.; p. 75 contains the original six lines about the name 'Letheon,' now considerably expanded and with a footnote reference to Appendix D; pp. 76-79 appendices.

Note: A preface dated 'Boston, May 30, 1847,' has been inserted between the title and the first page of text. This second issue of the second edition of Warren's tract contains in Appendix D (p. 79) the letter of Oliver Wendell Holmes suggesting the use of the words "anæsthesia" and "anæsthetic." The text of the letter, dated Boston, 21 November, 1846, is as follows:

My Dear Sir: Every body wants to have a hand in a great discovery. All I will do is to give you a hint or two as to names—or the name—to be applied to the state produced and the agent.

The state should, I think, be called "Anæsthesia." This signifies insensibility—more particularly (as used by Linnaeus and Cullen) to objects of touch. (See Good—Nosology, p. 259.)

The adjective will be "Anæsthetic." Thus we might say the state of Anæsthesia, or the anæsthetic state. The means employed would be properly called the Anti-æsthetic agent. Perhaps it might be allowable to say anæsthetic agent, but this admits of question.

The words anti-neuric, aneuric, neuro-leptic, neuro-lepsia, neuro-stasis, etc., seem too anatomical; whereas the change is a physiological one. I throw them out for consideration.

I would have a name pretty soon, and consult some accomplished scholar, such as President Everett or Dr Bigelow, senior, before fixing upon the terms, which *will be repeated by the tongues of every civilized race of mankind*. You could mention these words which I suggest, for their consideration; but there may be others more appropriate and agreeable. Yours respectfully, O. W. HOLMES
Dr. Morton.

Copies: DLC; DSG; MBM; MH; NN; NNNAM; Howe; Trent.

Copies used: CtY-MHi (i) without covers, from the collection of Edward C. Streeter; (ii) with front cover (yellow).

IV. 19.

ACCOUNT OF LETHEON, 3rd ed., 88 pp. [June] 1847.

Title: Some account | of | the Lethēon: | or, | who is the discoverer? | [half rule] | By Edward Warren. | [half rule] | Third edition.—Revised and enlarged. | Boston: | Dutton and Wentworth, Printers, | No. 37, Congress Street. | 1847.

Cover title: [rule] | Some account | of | the Letheon; | or, | who is the discoverer? | [half rule] | By Edward Warren. | [rule] .

Collation: 8° [1-7], 6-88 pp. Salmon-colored wrappers.

Contents: Cover 1 carries cover title; other 3 covers blank; p.[1] title; p.[2] blank; p.[3] Contents; p.[4] blank; pp.[5-6] Preface (still dated May 30, 1847); pp.[7], 6-83 text; pp.[84]-88 Appendix.

Note: This edition has been reset and repaginated and the order of materials to some extent changed. The O. W. Holmes letter now occurs in Appendix A, on pp. 84-85.

Copies: CtHM; DSG; MB; MBM; MH; MH-M; MHi; MdBM; MdU-D; NNC; PPCP; Clendening; Horine; Howe; Trent.

Copy used: CtY-MHi.

IV. 20.

ACCOUNT OF LETHEON, 3rd ed., 90 pp. [July] 1847.

Title: [Same as No. 19].

Note: Another issue of the third edition, with pp. 89-90 added—Jacob Bigelow's celebrated letter which had appeared in the 7 July number of the *Boston Medical and Surgical Journal*, entitled "Discovery of Etherism—The question settled." The inclusion of the Jacob Bigelow letter indicates that Warren's pamphlet must have come out the second week in July. Thus Warren says: "Although the

following communication, over the initials 'J.B.,' (understood to be those of Dr. Jacob Bigelow,) appeared too late to find a place in the body of my 'Account' of Dr. Morton's discovery, I cannot forbear appending it to the pamphlet, or, at least, to so many of the third edition as are not distributed. In this communication, the matter of the discovery seems to be pressed into a nut-shell."

Copies: An-C-MM-Os; CU-M; CtHM; MB; MBAt; MBM; NN; NNNAM; PPIU-D; TxU-M; Robinson; Trent; WU.

Copies used: CtY-MHi (i) uncut but without wrappers; (ii) in original green wrappers, with "Dr. Homans Tremont Street" on front wrapper (gift of Mr. Carroll A. Wilson of New York to JFF).

Morton's Other Writings on Ether and Chloroform

During the first months after Bigelow's announcement, Morton's time was taken up with litigation and with the voluminous correspondence arising out of his discovery. His first formal publication on the technique of etherization appeared in *The Lancet* in July 1847; he then issued the brochure, now rare and much sought-after, which gave full instructions concerning the administration of ether. It is a restrained and well-written statement, without the controversial tone of the Letheon tracts, and it is appropriately dedicated to the Surgeons of the Massachusetts General Hospital.

IV. 21.

LETTER TO THE LANCET

Boston, 30 June 1847.

Title: Letter from Dr. Morton, of Boston, U. S. | *To the Editor of The Lancet.* | [on an improved mode of administering ether] | *The Lancet*, 17 July 1847, 2, 80-81.

Note: This letter, which was evidently designed to remind his British colleagues that it was he, Morton, who first introduced ether, is important in that he announced he had abandoned the inhaler for the sponge in administering ether. Thus he says: "I was led . . . to make further experiments on the subject, which have resulted in an entire abandonment of my old inhaler, and the substitution of the sponge. This should be about the size of the open hand, or a little larger, and concave, to suit over the nose and mouth. The sponge is then thoroughly saturated with ether, applied to the nose and mouth, and, with the latter open, the patient directed to inhale as fully and freely as possible. In this way, I have found the result more sure and satisfactory, and the difficulty of inhalation very much reduced, or entirely removed. The most delicate or nervous females, or aged persons, as well as young children, are thus rapidly and almost imperceptibly narcotized, even before they are aware, as in some cases, that the administration has commenced. The beauty and importance of this means is its perfect

simplicity. Formerly, many persons could not be induced to persevere; now I do not find any who cannot inhale the vapour without serious difficulty."

IV. 22.

REMARKS ON ADMINISTERING ETHER *Boston*, [Sept.] 1847.

Title: Remarks | on the | proper mode of administering | sulphuric ether | by inhalation. | [short rule] | Boston: | Dutton and Wentworth, Printers. | 1847.

Cover title: Morton | on the | inhalation | of | sulphuric ether.

Half-title: Morton | on the | inhalation of sulphuric ether.

Collation: Sm. 8° (7 x 4 $\frac{7}{8}$ "). 44 pp. 1 l. Bound in light grey cardboard covers with "petit point" design in darker grey.

Contents: Cover 1, as above, followed by fly-leaf (back cover blank); p.[1] half-title; p.[2] blank; p.[3] title; p.[4] copyright (by W. T. G. Morton); p.[5] dedication "To the Surgeons of the Mass. Gen. Hospital, this little work is respectfully dedicated, as an evidence that their early and continued interest in the administration of sulphuric ether is gratefully appreciated, by their Obt. Servt. Wm. T. G. Morton"; p.[6] blank; pp.[7]-44 text; 1 l. 'Opinions of the press.'

Note: The review in the *Boston Medical and Surgical Journal* for 29 September 1847 may be quoted:

"We are indebted to the author, Dr. W. T. G. Morton, for a beautifully-printed little treatise, dedicated to the surgeons of the Massachusetts General Hospital, 'On the Proper Mode of Administering the Sulphuric Ether by Inhalation.' Dr. M., it is well known, is intimately identified with the discovery of this new agent in surgery. It would be a waste of labor for us to comment upon a subject that has received such universal attention of late, and it is therefore only necessary to observe that the object of this publication is to guide those who wish to act understandingly in using the ether, and particularly such as have had neither experience nor an opportunity of witnessing the process. This book makes the matter perfectly clear, so that there can be no misapprehension in regard to any essential point."

This is one of the rarest and most important of Morton's publications; it has been reprinted by C. N. B. Camac in his *Epoch-making contributions to medicine, surgery and the allied sciences* (1909, pp. 313-332); also (in part) in Logan Clendening's *Source book of medical history* (1942, pp. 366-372).

Copies: An-C-MM-Os; CtHM; DSG; MBM; MBMGH; MH-M (dark blue shiny cardboard covers) MH; NN; NNNAM; PPCP; RCP (Lond.).

Copy used: CtY-MHi.

When it became evident that Morton's use of ether for abolishing pain during surgical procedures was both safe and successful, Charles T. Jackson, M.D., an eminent chemist and geologist of Harvard who had urged upon Morton the local use of ether on painful teeth ("toothache drops") and who had also

on 30 September 1846 suggested that he use ether inhalation to pull Eben Frost's tooth, decided that he rather than Morton was entitled to primary credit for introduction of surgical anesthesia. Jackson was an eccentric genius who had made similar claims in the past; when S. F. B. Morse patented the telegraph Jackson promptly insisted that he had given Morse the idea, and he made similar trouble for Schönbein in 1846 over the discovery of gun cotton. Earlier (1834) he had had a brush with William Beaumont from whom he had attempted to steal the fistulous Alexis St. Martin.

It happened that Jackson was well known abroad and he had powerful friends in the French Academy of Sciences. Early in November he addressed a letter to the French Academy which was transmitted on 1 December stating that he was responsible for the discovery of ether anesthesia; that he had employed a Boston dentist to try it out during teeth extraction and, finding it successful for this purpose, he then had arranged to have the dentist try it out at the Massachusetts General Hospital during a major operation. Morton was not mentioned by name in Jackson's letter and when it came to Morton's attention that the French were giving Jackson full credit for the discovery, it was natural that Morton should have been impelled to make a counterclaim. He sent his agent, Edward Warren, to Paris, but members of the Academy were inclined to look upon both Warren and Morton as imposters.

In addition to his December letter, Jackson sent to Paris copies of the *Boston Daily Advertiser* for 1 March containing a paper by himself purporting to have been approved by the American Academy of Arts and Sciences. Actually the paper had not yet been read before the Academy, and it was subsequently disclaimed by the officers. Morton accordingly prepared a memoir which was eventually presented to the Academy of Sciences in Paris by Dr. Arago at the meeting of 2 November 1847. This was translated into French and published in Paris with a number of testimonials (No. 23). It was later reissued both in French (No. 24) and in English (No. 25) as an appendix to an official report on the history of the ether dis-

covery prepared by the Trustees of the Massachusetts General Hospital. The report and the memoir appeared in English in *Littell's Living Age* for 18 March 1848. A description of these three important documents follows.

IV. 23.

MEMOIR ON ETHER (French)

Paris, 1847.

Title: Mémoire | sur la découverte du nouvel emploi | de |
l'éther sulfurique | par | W.-T.-G. Morton, | de Boston,
Etats-Unis, | suivi des pièces justificatives. | [ornament] |
Paris, | Imprimerie d'Édouard Baurtruche, | rue de la Harpe,
90. | [short rule] | 1847 [Fig. 8]

Half-title: Mémoire | sur la découverte du nouvel emploi | de |
l'éther sulfurique.

Cover title: [same as title but within double-rule border].

Collation: 8°. [1-7], 8-60 pp.

Contents: p.[1] half title; p.[2] statement concerning translator, Eugène Henrion, *avocat*; p.[3] title; p.[4] blank; pp.[5-6] unsigned preface (formal request for a hearing, written in third person); pp. [7]-28 text of *Mémoire* (in first person); pp. 29-60 *Pièces justificatives*.

Note: The text of the memoir is reprinted as an appendix to the French edition of the Massachusetts General Hospital administrative report mentioned in the next entry. Although dated 31 July 1847, the copy received by the French Academy of Sciences did not arrive until the time of their meeting of 2 November 1847 (*Comptes Rendus*, 25, 626).

Copy used: Photostat from Boston Athenaeum.

IV. 24.

MEMOIR ON ETHER (French), 2nd ed.

Cambridge, 1848.

Title: Rapport | des administrateurs de l'Hôpital Général | de
Massachusetts; | suivi de | l'histoire de la | découverte de
l'éther; | et du | mémoire | adressé par le | Docteur Morton,
à l'Académie française. | [half-rule] | R. H. Dana, Jr.,
Éditeur. | [half-rule] | Cambridge [Mass.]: | Imprimerie de
Metcalf et Compagnie. | 1848.

Cover title: [same, within ruled border].

Collation: 8°. 144 pp., 2 ll.

Contents: p.[1] title; p.[2] blank; pp.[3]-4 'Au Public'; pp.[5]-127 text; pp.[128]-

MÉMOIRE
SUR LA DÉCOUVERTE DU NOUVEL EMPLOI
DE
L'ÉTHÉR SULFURIQUE

PAR
W.-T.-G. MORTON,
DE BOSTON, ETATS-UNIS,
SUIVI DES PIÈCES JUSTIFICATIVES.

PARIS,
IMPRIMERIE D'ÉDOUARD BAUTRUCHE,
RUE DE LA HARPE, 90.

—
1847

FIG. 8. Title-page of the first (French) edition of Morton's Memoir to the Academy of Sciences at Paris

144 text of Morton's Memoir to the Academy of Sciences of Paris; p.[145] statement of the translator; p.[146] blank; p.[147] bibliographical notice.

Note: The reprint of the Memoir on ether (pp. 128-144) omits the '*pièces justificatives*' since these have been largely absorbed in the text of the preceding official history that had been prepared by Richard H. Dana, Jr., for the Trustees of the Massachusetts General Hospital. This official Hospital history of the ether controversy was published simultaneously in French and in English, the English version having been published in *Littell's Living Age* for 18 March 1848 (see next entry).

Copies: No census was taken of this item and our list is therefore too incomplete to publish.

IV. 25.

MEMOIR ON ETHER (English)

Boston, 1848.

Title: Dr. Morton's memoir to the Academy of Sciences at Paris, presented by M. Arago, in the autumn of 1847. *Littell's Living Age*, No. 201, 18 March 1848, pp. 566-571.

Note: This, the English version of Morton's celebrated Memoir to the French Academy, is appended as was the preceding French edition to the official history of the controversy by Richard H. Dana, Jr. The history reprints pages 10-45 of the much discussed *Report of the Board of Trustees of the Massachusetts General Hospital* which had been issued on 26 January 1848 over the names of N. I. Bowditch and J. W. Edmands. As published in the *Living Age*, the Dana history is without a formal title save as it appears in the table of contents ('A History of the ether discovery'), and there is no record of offprints having been made which would have established the 'History' as a separate bibliographical entity. This particular number of the *Living Age* evidently had a large circulation since the number itself is frequently found separate from the general run of that periodical. It includes on pages 571-575 a detailed account of the death of John Quincy Adams.

IV. 26.

MEMOIR ON ETHER (English)

New York, 1946.

Title: A memoir | to the Academy of Sciences at Paris | on a new use of | sulphuric ether | By W. T. G. Morton | . . . | Presented by M. Arago in the autumn of 1847 | With a foreword by | John F. Fulton | Henry Schuman * New York | 1946

Note: A 26-page reprint issued by the Historical Library, Yale University School of Medicine, in recognition of the ether centennial and also to offset some of the unnecessarily harsh things said of it by Raper in his *Man against pain* (1945, pp. 295-297).

The months following the first demonstrations of ether, filled with continued experiments in its administration and with correspondence that assumed discouraging proportions, had taken Morton entirely away from his regular professional pursuits. However, late in 1847 he issued his little-known tract on teeth which gives notice of his return to the practice of dentistry and to which he appended letters and press comments about the use of ether.

IV. 27.

ON THE LOSS OF TEETH

Boston, 1847.

Title: On the | loss of the teeth, | and the | modern way of restoring them, | as practised by | W. T. G. Morton | and | Francis Whitman, | Surgeon dentists, No. 19 Tremont Row, | opposite the new museum. | Boston: | Printed by Damrell & Moore, | No. 52 Washington Street. | 1847.

Collation: 16°. [1-3], 4-23 pp., 2 illus.

Contents: p.[1] title; p.[2] copyright; 2 plates showing female profile with and without the author's dentures; pp.[3]-17 text; pp.[18]-23 Appendix entitled 'Great Discovery.'

Note: The copy in the Army Medical Library is without covers. No other copy traced. The Appendix has the usual testimonials about Morton's priority in the discovery of ether anesthesia.

Copies: DSG; CtY-MHi (photostat).

IV. 28.

ON THE LOSS OF TEETH, 2nd ed.

Boston, 1848.

Title: [Same as 1st ed. up through W. T. G. Morton; then follows:] Author of "Morton on the Inhalation of Ether," "Voice from | Europe," &c. | Surgeon Dentist, No. 19 Tremont Row, | Opposite the New Museum. | Second edition of ten thousand copies. | Boston: | Printed by William A. Hall, | No. 22 School Street. | 1848.

Cover-title: Morton | on the teeth.

Collation: 16°. [1-3], 4-32 pp., 2 illus.

Contents: p.[1] title; p.[2] Contents; p.[3]-16 text; pp. 17-32 Appendix.

Note: Francis Whitman had died in the course of the year and Morton promptly issued a new edition which according to the title ran to 10,000 copies, of which

number only two have been traced. He has filled out the appendix with further testimonials about ether anesthesia so as to make a full 16-page printing form for the second signature. The back of the front cover contains the copyright statement and advertising blurbs concerning Morton's artificial teeth.

Copies: DSG; MSaE.

Copy used: Photostat from Essex Institute, Salem.

J. Y. Simpson of Edinburgh had discovered the anesthetic properties of chloroform on 4 November 1847. As recorded below in Section VI, his first verbal communication on chloroform was made on 10 November, and he published his first paper five days later. A copy reached C. A. Harris of Baltimore on or just before 19 December (see *Boston Medical and Surgical Journal*, 1847, 37, 442). Morton received the Simpson pamphlet a few days later and it was natural that he should be intensely interested. On 25 December he described his first experiments with chloroform in a letter to the *Boston Medical and Surgical Journal* (where it was published on Wednesday, the twenty-ninth). Since this interesting document is brief and little known, the full text is given in the following entry.

IV. 29.

EXPERIMENTS ON CHLOROFORM

Boston, 25 Dec. 1847.

Title: Result of experiments in Boston with chloroform. *Boston med. surg. J.*, 29 Dec. 1847, 37, 447.

Text: To the Editor.—Sir,—From your apparent interest in the success of my discovery for the alleviation of pain in surgical operations, I have ventured to lay before the readers of your Journal a condensed account of Prof. Simpson's new method of producing insensibility, also the formula for the preparation of the compound used by him, together with the result of his experiments, all of which he kindly forwarded to me by the last steamer, with an acknowledgment of the merit attached to my previous discovery of the application of sulph. ether. The result of his experiments I was resolved to test immediately, and being out of health myself, I called upon Dr. E. R. Smilie, a person of some reputation in chemical science, and invited him to my laboratory. He politely assisted me in preparing and administering the chloroform (the name given to the new compound), also in observing its peculiar effects upon the system. As we were about to apply heat for the purpose of distilling from the mixture of the following formula—chloride of lime, one part; aqueous solution, one part; rectified spirit one twelfth of a part—a patient opportunely arrived for the purpose of inhaling ether, and having three teeth extracted under its operation. With a little trouble she was persuaded to remain until there was a sufficient quantity of chloroform distilled for the experiment. After inhaling ether and allowing its effect to pass away, about one ounce of chloroform was put upon the sponge previously freed from the effect of sulph. ether, and administered by the usual method. In order to contract this communication as much as possible, we

have purposely avoided the details of the case. The teeth were extracted without the knowledge of the patient, and we would say that the effects were similar to those produced by ether.

Yours respectfully,

W. T. G. MORTON

Saturday, Dec. 25th, 1847.

Note: There is no indication that Morton ever had the letter separately re-printed.

Another important publication was Morton's final paper on the comparative value of ether and chloroform. Questions had been raised concerning the toxicity of the new volatile agent, and some had felt that chloroform was preferable to ether. Morton returned a clear-cut answer by giving an analysis of the forty-four consecutive cases drawn "from a short period of my practice" covering ages from three to forty-three. He concluded: "From these cases, forty-four in number, we see that both sexes are affected in the same manner; that ether may be given at all ages; that for ordinary operations the quantity required varies from one half to two ounces; that insensibility is produced in from one to four minutes; that recovery takes place in less time, proportioned to the severity of the operation; that it is well borne by every variety of temperament; that the pulse, when affected at all, is generally slightly quickened, rarely slower than natural; and that for the most part those under its influence remain perfectly quiet, and undisturbed by nausea or vomiting."

IV. 30.

ETHER AND CHLOROFORM

Boston, Sept. 1850.

Title: Comparative value of sulphuric ether and chloroform.

By W. T. G. Morton, M.D., Boston. *Boston med. surg. J.*,
11 Sept. 1850, 43, 109-119.

Note: The text of this article is identical with that published separately under a different title in No. 31.

IV. 31.

PHYSIOLOGICAL EFFECTS OF ETHER

Boston, 1850.

Title: On the | physiological effects | of | sulphuric ether, | and
its | superiority to chloroform. | [half rule] | By William T.
G. Morton, M.D. | [half rule] | Boston: | Printed by David

Clapp, 184 Washington Street. | Medical and Surgical Journal Office. | 1850.

Cover title: Physiological effects of | sulphuric ether. | By W. T. G. Morton, M.D.

Collation: 8°. 24 pp. Paper covers.

Contents: Cover 1 as above (other 3 covers blank); p.[1] title; p.[2] blank; p.[3] Preface, dated '19 Tremont Row, Boston. September, 1850.'; p.[4] blank; pp.[5]-18 text; pp.[19]-24 Appendix containing correspondence of September, October and early November 1850, including a letter from 'J. Knight, M.D., Professor of Surgery in Yale College.'

Note: The text of this pamphlet is based on No. 30 and appears in two forms: one without Appendix (18 pp.) issued in September; the other with the Appendix issued in November. Morton discusses the history of the discovery and mode of action of ether on the nervous system and on the blood-vessels. He disagrees with Flourens that ether affects the cerebrum first, insisting that the cerebellum and medulla oblongata are the earliest affected. He also outlines ten reasons why ether is superior to chloroform.

Copies: An-C-MM-Os; CtHM; DSG; MB; MBM; MBMGH; MBAt; MHi; MWA; PPCP; PPIU-D.

Copy used: CtY-MHi. Dr. Cushing's copy, dedicated on front cover to 'J. A. Allen, M.D. 188 Tremont St. with the respects of W. T. G. Morton.' Recently bound in half leather (contains appendix).

IV. 32.

ON ETHER AND CHLOROFORM

Boston, 1850.

Title: Remarks | on the | comparative value | of | ether and chloroform, | with hints upon | natural and artificial teeth, | by W. T. G. Morton, M.D. | No. 19 Tremont Row, Boston, opposite the Museum. | Boston: | Printed by William A. Hall. | No. 22 School Street. | 1850.

Covers (blue): Cover 1 | Morton | ; Covers 2 and 3 blank; cover 4 carries a woodcut of building labelled 'Morton's Tooth Manufactory.'

Collation: 16°. 48 pp.

Contents: p.[1] title; p.[2] To the Public; pp.[3]-4 Contents; pp.[5]-15 text (reprinted from No. 30); pp. 15-21 'Decisions on the ether discovery'; pp. 22-34 'Hints on natural and artificial teeth'; pp. 34-36 'Dr. Morton's Tooth Manufactory'; pp.[37]-48 'Testimonials, &c.' (in reference to Morton's dentistry and the ether discovery).

Note: Another pocket brochure similar to those described above (Nos. 27 and 28). The first article is another reprint of No. 30. This is followed by further quotations about the ether controversy and his hints about teeth.

Copy: Photostat from Massachusetts Historical Society.

IV. 33.

ADDRESS IN CINCINNATI GAZETTE

Cincinnati, 1866.

Title: [A speech by W. T. G. Morton.] *Cincinnati Gazette*, 28 Dec. 1866.

Note: The text of this unfortunate piece has been reproduced in full by Raper in his *Man against pain* (1945, pp. 290-295). It has all the earmarks of an extemporaneous speech taken down somewhat freely by an inexperienced reporter; and while it is possible that Morton may have spoken as loosely as the *Gazette* reporter indicates, it is impossible to follow Raper in concluding that because of this colorful exaggeration we must proclaim him a deliberate pathological liar; it seems more likely that there was a touch of arteriosclerosis behind it (he died of a stroke eighteen months later), perhaps combined with a good dinner.

IV. 34.

ETHER IN THE CIVIL WAR

Chicago, 1904.

Title: The use of ether as an anesthetic. At the Battle of the Wilderness in the Civil War. Reprinted from *J. Amer. med. Ass.*, 23 April 1904, 42, 1068-1073. (Reprint: 15 pp., in grey wrappers.)

Note: This is an abstract of an unpublished paper written by Morton in May 1864 soon after the Battle of the Wilderness. It was released for publication by his son, Dr. William J. Morton of New York, at the request of Dr. Henry O. Marcy of Boston, thirty-six years after Morton's death, and is the only source of information concerning Morton's record in the Civil War. He did not enlist in the Army, but he states that his services had been "requisitioned" at the time of the Battle of the Wilderness in May 1864. There can be little doubt that Morton served, but there is no reliable information concerning his period of service, and according to Raper (p. 298) the Adjutant General's Office of the War Department has no record indicating that Morton served the Army in any official capacity during the Civil War. If anyone uncovers information bearing on Morton's war experience, it clearly deserves to be recorded.

Copies: No census taken.

Biography, Commentary and Testimonials

IV.

35. ANÆSTHESIA. *Harper's New Monthly Mag.*, Sept. 1865, 31, 453-460.

36. *Appeal to the patrons of science and the friends of humanity.* Boston [1857]. 22, [2] pp.

37. *An appeal to the public, by members of the medical profession, in New-York.* 1858. New-York, G. F. Nesbitt & Co., 1858. 20 pp.

38. *An appeal to the public, by members of the medical profession.* New York, W. C. Bryant & Co., 1859. 44 pp.

39. BAKER, Rachel. *Dr. Morton, pioneer in the use of ether.* Illust. by Lawrence Dresser. New York, Julian Messner, Inc., 1946. 224 pp.

40. BIOGRAPHICAL sketch of Dr. William T. G. Morton. Reprint from *Phy-*

sicians and Surgeons of America [Concord, N. H., 1896, 803-806], 11 pp.

41. BOSTON. Committee of citizens chosen to raise a Morton testimonial fund. *Historical memoranda relative to the discovery of etherization, and to the connection with it of the late Dr. William T. G. Morton*. Boston, Rand, Avery, & Frye, 1871. 16 pp.

42. BOWDITCH, N. I. *The ether controversy. Vindication of the hospital report of 1848*. Boston, Printed by J. Wilson, 1848. 32 pp.

43. — *A history of the Massachusetts General Hospital*. Not published. Boston, John Wilson & Son, 1851, xi, 442 pp., 1 l. (Pages 212-341 are devoted to the ether discovery. The hospital report of 1848 is reprinted on pp. 215-248.)

44. — *A history of the Massachusetts General Hospital*. [To August 5, 1851.] . . . [Privately printed in 1851.] 2d ed., with a continuation to 1872. Boston, Printed by the Trustees from the Bowditch Fund, 1872. xvii, 734 pp.

45. *Discovery of etherization. Brief embracing the legal points of Dr. Morton's case*. [Washington? n.d.] 7 pp.

46. DUSINBERRE, A. B. William Thomas Green Morton. *Clifton med. Bull.*, 1926, 12, 145-154.

47. DWINELLE, W. H. *The casket and the ribbon, or, The honors of ether*. Baltimore, J. W. Woods, 1849. 26 pp.

48. FULTON, J. F. Henry Jacob Bigelow (Mar. 11, 1818-Oct. 30, 1890). *Dictionary of American Biography* (New York, Scribners), 1929, 2, 256-257.

49. — William Thomas Green Morton (Aug. 9, 1819-July 15, 1868). *Ibid.*, 1934, 13, 268-271.

50. HALE, Sarah J. Etherton cottage, and the discoverer of etherization. *Godey's Mag. & Lady's Book*, 1853, 46, 205-212.

51. HAYDEN, W. R. The discovery of ether. *The Bostonian*, 1896, 3, 315-328.

52. KNOFF, S. A. A tribute to Morton. Ether Day at the meeting of the American Medical Association in Boston. *Amer. Med.*, 1921, 16, 289-295.

53. — William T. G. Morton, the discoverer and revealer of surgical anesthesia: a plea for his place in the Hall of Fame. *Boston med. surg. J.*, 1920, 183, 317-321. Election of a physician to the Hall of Fame [editorial]. *ibid.*, 60. "Dr. Morton in the Hall of Fame," letter to the Senate of the University of New York, signed George W. Gay. *Ibid.*, 341. (Three papers bound together, 19 pp.)

54. — William T. G. Morton, the discoverer and revealer of surgical anesthesia, at last in the Hall of Fame—a vindication. *Med. Rec.*, 1921, 99, 174-176.

55. MCCRILLIS, H. O. The conquest of pain. *New Engl. Mag.*, 1908, n.s.38, 245-256.

56. MCMECHAN, F. H. Morton bust presentation address. *New Engl. J. Med.*, 1928, 199, 881-884.

57. MASSACHUSETTS GENERAL HOSPITAL. *Report of the Board of Trustees . . . presented to the Corporation, at their annual meeting, January 26, 1848*. Boston, John Wilson, 1848. 72 pp. (Report on ether, pp. 10-45.)

58. MORTON, Elizabeth Whitman [wife of W. T. G. M.] The discovery of anæsthesia. Dr. W. T. G. Morton and his heroic battle for a new idea.—How painless surgery began fifty years ago. *McClure's Mag.*, Sept. 1896, 7, 311-318. (Gives an eye-witness account of Morton's stroke and subsequent death.)

59. MORTON, W. J. *The invention of anæsthetic inhalation; or, "Discovery of anæsthesia."* New York, Appleton, 1880. 48 pp. (Reprint, with additions and alterations, from *Virginia med. Monthly*.)

60. — Memoranda relating to the discovery of surgical anesthesia. *Post-Grad.*, 1905, 20, 333-353.

61. POORE, B. P. *Historical ma-*

- terials for the biography of W. T. G. Morton, M.D., discoverer of etherization, with an account of anæsthesia. Washington, 1852. 114 pp. (Photostat.)
62. *Proceedings in behalf of the Morton testimonial*. Boston, G. C. Rand & Avery, 1861. 56 pp.
63. *Proceedings of the Morton testimonial*. Boston [1868]. 140 pp. (A reprint of the preceding, with substantial additions (pp. 43-76 and 87-140). Issued by the Executive Committee on Morton testimonial, Newburgh, N. Y.)
64. *Proceedings of the governors of the almshouse of the city of New York . . . on the appeal of the medical profession to raise a national testimonial for the benefit of the discoverer of anæsthesia*. New York, W. C. Bryant & Co., 1859. 16 pp.
65. RICE, N. P. *Trials of a public benefactor, as illustrated in the discovery of etherization*. New York, Pudney & Russell, 1858. 4 p.l., [v]-xx, [13]-460 pp.
66. — New York, Pudney & Russell, 1859. (Same pagination.)
67. ROTH, G. B. The "original Morton inhaler" for ether. *Ann. med. Hist.*, 1932, *n.s.* 4, 390-397.
68. SLADE, D. D. Historic moments: the first capital operation under the influence of ether. *Scribner's Mag.*, 1892, 12, 518-524.
69. SNELL, E. L. Dr. Morton's discovery of anesthesia. *Century Mag.*, 1894, 48, 584-591.
70. *Testimonial of members of the medical profession of Philadelphia, New York, and Boston, in behalf of Wm. T. G. Morton, M.D.* Philadelphia, Collins, 1860. 32 pp.
71. U. S. 30th Congress. 2d session. House. Report [of] Select Committee, to whom was referred the memorial of William T. G. Morton, asking compensation from Congress for the discovery of the anæsthetic or pain subduing property of sulphuric ether. [Washington, 1849.] 46 pp. (Report No. 114.)
72. — W. T. G. Morton. February 28, 1849. [Washington, 1849.] 99 pp. (Report No. 114. Minority report, submitted by Mr. Lord.)
73. U. S. 32d Congress. House. Brief of points and proofs in regard to the proposed appropriation to enable the President to procure the surrender of the patent issued to Dr. W. T. G. Morton, for the discovery of the anæsthetic properties of sulphuric ether. [Washington? 1852?] 23 ll. (Attached flyleaf addressed to Members of Congress.)
74. U. S. 32d Congress. 1st session. House. [Report of] the Select Committee to whom was referred the memorial to Dr. William T. G. Morton, asking remuneration [etc.] [Washington, 1852] 128 pp.
75. U. S. 32d Congress. 2d session. Senate. Report [of] Mr. J. P. Walker . . . [as Chairman of] the Select Committee, to which were referred the various memorials in regard to the discovery of the means by which the human body is rendered uniformly and safely insensible to pain under surgical operations . . . [Washington, 1853] 8, 39, [1] pp.
76. — *Statements, supported by evidence, of Wm. T. G. Morton, M.D., on his claim to the discovery of the anæsthetic properties of ether . . .* Washington, 1853. 582 pp., 1 l., 135 pp.
77. U. S. 37th Congress. 3d session. Senate. Report [of] the Committee on Military Affairs and the Militia, to whom was referred the petition of Dr. William T. G. Morton, asking compensation [etc.] [Washington, 1863] 166, ii pp.
78. VIETS, H. R. The problem of the three Edward Warrens. *New Engl. J. Med.*, 1941, 224, 1074-1076.
79. WORCESTER BANK AND TRUST COMPANY. *Forty immortals of Worcester and its county*. [Boston] 1920. 72 pp. ("William T. G. Morton," pp. 54-55.)

V. CHARLES T. JACKSON

THE claims of Charles Jackson in the anesthesia controversy were based primarily on the fact that on 30 September 1846 he had proposed its use to Morton to allay pain in the pulling of teeth. As early as 1841, however, he had inhaled it and in 1844 he had suggested its local use to relieve toothache; in September 1845 he again tried inhaling ether. On finding that it made him unconscious, he informed Mr. J. Peabody and later Morton and, as already recorded, Morton proceeded forthwith to extract a tooth "under" ether. When Morton applied for a patent, recognizing that he was indebted to Jackson, he consented (under pressure from Jackson) to take the patent out jointly under the name of Morton and Jackson, so that neither one claimed sole credit of discovery. Morton appears to have lived up to his agreement, but he was much chagrined early in February to hear that on 18 January 1847 "a paper had been read by M. Élie de Beaumont before the Academy of Sciences at Paris, in which this discovery was announced as that of Dr. C. T. Jackson, of Boston, Dr. Morton's name not being even mentioned, and all the experiments, at the hospital and elsewhere, stated as made by the request and direction of Dr. Jackson. Still more were the intimate parties astonished, to find that this communication was made from a letter from Dr. Jackson himself to M. Élie de Beaumont, dated Nov. 13th, and sent out to Europe after, and in direct violation of, the agreement." The thirteenth was the day after signing the Patent agreement (see IV.15, p. 47).

Original Papers

V. 1.

LETTER TO FRENCH ACADEMY

13 Nov. 1846.

Title: Première Lettre.—Boston, le 13 novembre 1846 [from Charles T. Jackson]. *Comptes Rendus des Séances de l'Académie des Sciences*, Paris, 18 January 1847, 24, 74-76. With discussion by Velpéau, Serres, and Roux, pp. 76-79.

Note: The letter as published in the *Comptes Rendus* was in French. It was again

published by Jackson in English in *A manual of etherization* (Boston, 1861), pp. 54-56. Although written on 13 November 1846, it was not sent until 1 December when he added in a covering letter: "The application of ether vapor has been fully tried in this country, and is in full and successful use in the Massachusetts General Hospital." Élie de Beaumont in whose care they were sent had received the sealed packet on 28 December, but it was not opened until the meeting of the Academy on 18 January 1847. Meanwhile, however, Malgaigne had reported on the use of ether in four surgical cases on 12 January before the Royal Academy of Medicine at Paris. In Velpeau's discussion he indicated that he had heard from Warren, and Morton is mentioned as having first administered ether. Further references to Jackson's claim are to be found on pp. 373 and 473-475 of the *Comptes Rendus* for 1847 (Jan.-June).

Text: "I ask permission to communicate, through you, to the Academy of Sciences, a discovery which I have made, and which I believe to be important for the relief of suffering humanity, and of great value in surgical art. It is five or six years since I recognized the peculiar state of insensibility into which the nervous system is plunged by the inhalation of the vapor of pure sulphuric ether, which I inhaled in large quantities, first for experiment, and afterwards when suffering from a severe inflammation, caused by the inhalation of chlorine. I have recently made use of this fact, by inducing a dentist of this city to administer the vapor of ether to persons whose teeth he was about to extract. It was observed that these persons did not suffer any pain during the operations, and that no inconvenience resulted from the administration of ether.

"I next urged this dentist to go to the Massachusetts General Hospital, and administer the ether vapor to a patient who was to undergo a painful surgical operation. The result was, that the patient did not feel the least pain, and did well afterwards. An operation near the jaw, the amputation of a limb, and the excision of a tumor were the subjects of the first surgical experiments.

"Since then numerous surgical operations have been performed, on different patients, with like success, and always without pain. The patients have convalesced well, not having suffered any nervous shock.

"I desire that the Academy of Sciences will have the goodness to appoint a commission to make the necessary experiments, in order to prove the exactitude of the assertions which I address you, concerning the remarkable effects produced by the inhalation of ether vapor.

"One may very conveniently breathe this vapor, by dipping a large sponge in ether, placing it in a short conical tube, or in a funnel, and drawing the atmospheric air into the lungs, through the sponge thus saturated with ether. The air may be ejected by the nose, or valves may be placed on the tube or funnel, so that the breath may not traverse the sponge and weaken the ether by aqueous vapor.

"At the end of a few minutes the patient falls into a very peculiar state of sleep and may be submitted to any surgical operation without his feeling the least pain; his pulse becomes generally a little more rapid, and his eyes shine, as from the effect of a peculiar excitement. When he recovers from this state, in a few minutes, he will say to you that he has been asleep and has dreamed.

"Ordinary weak (alcoholic) ether will not produce the proper effect. The patient will only be made drunk by it, and will suffer headache afterwards. We should use, therefore, only the most highly rectified ether.

"If a dentist extracts teeth in the evening, he should employ a Davy safety lamp, for a naked flame might cause an explosion if brought near the mouth.

"In the administration of ether vapor it is important to have it in large volume, so that it may be inhaled freely and produce its effects promptly, because we

thus avoid all disagreeable sensations; but there is no danger to be feared from prolonged inhalation of ether vapor, provided that atmospheric air also is properly admitted. In prolonged operations we apply the ether vapor several times, at proper intervals, so as to keep the patient in this (ethereal) sleep."

While Jackson was being called to task for his premature letter to the French Academy, he made an even stranger move by publishing his claim in a Boston newspaper: To quote Dana (IV.25):

On the 1st day of March, prior to the meeting of the academy, there appeared in the *Daily Advertiser* a long letter, purporting to have been read before the American Academy of Arts and Sciences, by Dr. C. T. Jackson, and apparently carrying with it the sanction of the academy, with the names of Edward Everett, Dr. John C. Warren, and others, well known in Europe. Dr. Jackson sent a number of papers to Europe by the steamer of that day, and there can be no doubt that his object in printing it on that day was to send the letter, at once, and in the most convenient form, to Europe. In Europe, this letter was universally considered as giving the sanction of the academy to Dr. Jackson's claims, and created a tide of opinion in his favor which Dr. Morton could not stem, and which was only checked by the subsequent news, even now, perhaps, not generally diffused, that the letter had never, in fact, been read before the academy, nor officially called for.

The academy did not print Dr. Jackson's letter among its transactions; all responsibility for it was distinctly disavowed, and his printing it was severely commented upon.

Edward Warren answered Jackson's letter on 2 March, also in the *Daily Advertiser*, and Morton published a short note on 5 March indicating his approval of Warren's rebuttal (see Warren's *Letheon* [IV.16], pp. 26-32).

V. 2.

LETTER IN *Daily Advertiser*

Boston, 1 March 1874.

Title: Antidote to physical suffering. *Boston Daily Advertiser*, 1 March 1847, p. 2.

Note: The address is introduced by the following editorial statement: "The important discovery of a method by which the most difficult and painful surgical operations can be performed, while the patient is placed in a state of temporary insensibility, by the simple process of inhaling the *vapor of ether*, in proportion as it becomes more extensively known, is from day to day more fully attested

by proofs of its efficacy, in a great variety of cases, and of its safety when prudently and skilfully applied. The English and French Journals, received by the last Mail Packet from England, record a great number of cases of the successful application of the discovery in London, Edinburgh and other parts of Great Britain, and also in Paris. These proofs of the extensive usefulness of the discovery, in addition to the well-known successful application of it in repeated cases, both at the hospital, and by private practitioners, in this city, will naturally excite a stronger curiosity to learn the history of the discovery from the most authentic source.

"We are therefore gratified in being permitted by Dr. Jackson to lay before our readers the following paper, addressed by him to the American Academy of Arts and Sciences, of which body he is a member, prepared at the request of many gentlemen of Science, and particularly of Mr. Everett, President of the University in Cambridge, and Vice President of the Academy, and our eminent surgeon, Dr. John C. Warren, professor of Anatomy. We subjoin also the note of Mr. Everett requesting the communication of the article."

There follow the letters addressed to Jackson by Edward Everett and John C. Warren, on 26 and 27 February 1847 respectively, suggesting that he present a paper on 'a mode of producing temporary insensibility to pain'—to use Mr. Everett's words. This number of the *Advertiser* was sent to the French Academy with a covering letter dated 28 February 1847 in which Jackson's claims are reiterated. The text of this February letter to the Academy was issued in part in the *Comptes Rendus* for 22 March (pp. 492-494).

On the same day, *i.e.*, 1 March, "after the close of the Medical School" Jackson was called upon by Dr. Jacob Bigelow who "hoped that no ether would be discovered sufficiently strong to render them insensible to the merits of its original suggester." Jackson reiterated his usual story and ended with a persuasive sophistry (*Boston med. surg. J.*, 1847, 36, 180): "It would certainly be unwarrantable for the miner, who carried Davy's safety lamp into the fire damps of a mine, to dispute the claims of its original inventor; for he received that instrument already proved to be efficient, with the assurance that it would guide him in safety amid the explosive gases of the mine."

A little known paper which Jackson had submitted to the American Institute of the City of New York late in 1851 has recently come to our attention. A brief description follows:

V. 2a.

ETHERIZATION OF ANIMALS AND MAN *Albany*, Dec. 1851.

Title: Etherization of animals and of man. *Transactions of the American Institute of the City of New-York, for the year 1851.* Albany, Charles Van Benthuysen, Printer to the Legislature, 1852, pp. 167-173.

Note: The paper opens with this statement: "During the winter of 1841-42 I discovered that the nerves of sensation could be temporarily paralyzed to all sensation of pain by the pulmonary inhalation of the vapor of pure sulphuric ether (oxide of ethyle) mixed with air, and that while the human body was thus affected, that any surgical operation could be performed upon the etherized patient without producing any painful sensations. In 1846 I caused this

discovery to be practically exemplified by applying it in surgical operations both in this country and in Europe, where it was also used by my directions." No explanation is given of why he waited four years before communicating this great discovery to the world. At the end he criticizes the method of administering ether and chloroform at the Massachusetts General Hospital (Morton's sponge technique which superseded his inhaler; see p. 53), and states on somewhat tenuous evidence that etherization and drunkenness are quite different one from the other.

Copy: Photostat from Dr. J. C. Trent.

Jackson, realizing that he had published nothing of a formal nature on his "discovery," eventually in 1861 issued a manual of etherization compiled from the experience of others.

V. 3.

MANUAL OF ETHERIZATION

Boston, 1861.

Title: A | manual of etherization: | containing directions for the employment of | ether, chloroform, and other anæsthetic agents, | by inhalation, | in | surgical operations, | intended for military and naval surgeons, and all who may | be exposed to surgical operations; with instructions | for the preparation of ether and chloroform, | and for testing them for impurities. | Comprising, also, | a brief history of the discovery of anæsthesia. | By Chas. T. Jackson, M.D., F.G.S.F., | Chevalier de la Légion d'Honneur [etc.] | [brief rule] | Boston: | Published for the author by J. B. Mansfield, | 39 Court Street. | 1861.

Collation: 12°. 1-11⁶, 12⁴; 134 pp., 3 ll.

Contents: p.[1] title; p.[2] copyright; p.[3] 'To the Reader'; p.[4] dedication to Élie de Beaumont; pp.[5]-134 text; p.[135] 'Charles T. Jackson, State Assayer,' etc.; p.[136] blank; pp.[137-138] advts.; pp.[139-140] blank.

Note: In his recent volume on the history of anesthesia (*Man against pain*, 1945), Raper makes the following penetrating comments concerning Jackson and his book: "It will be obvious to anyone reading this little book that the author is a well-informed, intelligent man. It is strange and distressing to find such a person unbalanced by ambition and so losing control of an otherwise well-disciplined mind. . . . After the great idea of anesthesia flashed into Dr. Jackson's mind, he proceeded, with great intensity, to do nothing at all about it until four years later, when Morton came to him, on the advice of Horace Wells, to get some nitrous oxide gas. And then he turned over the whole thing to him. Why he selected Morton, whose scientific attainments and ability he held in contempt, to carry out such important scientific work is impossible to imagine, and Jackson found it impossible to explain."

Jackson describes the scope of his volume in the following terms: "This little

book has been written with a view to interest both the Surgeon and the Soldier, and with the intention of aiding the one and of informing the other, as to the nature, effects, and management of Anæsthetic agents. . . . It is not intended to place a small work, like this, in competition with more extended and elaborate treatises by others, but rather to fill up a space which no one has thus far occupied."

Biography and Commentary

V.

4. A[BBOT], J. H. Principles recognized by scientific men applied to the ether controversy. *Littell's Living Age*, 1848, 17, no. 214, 565-569.

5. [ABBOT, J. H.] The discovery of etherization. *Atlantic Monthly*, June 1868, 21, 718-725.

6. BARBER, William. Dr. Jackson's discovery of ether. *National Mag.*, Oct. 1896, 5, 46-58.

7. EMERSON, E. W. *A history of the gift of painless surgery*. Boston: Houghton, Mifflin & Co., 1896. [v], 9 pp. (Repr. from *Atlantic Monthly*, Nov. 1896, 78, 679-686.)

8. GAY, Martin. *A statement of the claims of Charles T. Jackson, M.D. to the discovery of the applicability of sulphuric ether to the prevention of pain in surgical operations*. Boston, David Clapp, 1847. 29, xviii pp.

9. JACKSON, J. B. S. Review of Dr. M. Gay's statement of Dr. Charles T. Jackson's claims to the discovery of the inhalation of sulphuric ether, as a preventive of pain. n.p., n.d., 8 pp. Repr. from *Boston med. surg. J.*, 30 June 1847, 36, 429-434.

10. KENDALL, Amos. *Morse's patent. Full exposure of Dr. Chas. T. Jackson's pretensions to the invention of the American electro-magnetic tele-*

graph. Washington, J. T. Towers, 1852. 64 pp.

11. LORD, J. L. & H. C. *A defence of Dr. Charles T. Jackson's claims to the discovery of etherization. Containing testimony disproving the claims set up in favor of Mr. W. T. G. Morton, in the report of the trustees of the Massachusetts General Hospital, and in No. 201 of Littell's Living Age*. Boston, Office of Littell's Living Age, 1848. 1 p.l., 37 pp.

12. — *Memorial address to the Trustees of the Massachusetts General Hospital in behalf of Charles T. Jackson, M.D., in relation to the discovery of etherization*. Boston, Thurston, Torrey, and Company, 1849. 27 pp.

13. MERRILL, G. P., and FULTON, J. F. Charles Thomas Jackson (June 21, 1805-Aug. 28, 1880). *Dictionary of American Biography* (New York, Scribners), 1932, 9, 536-538.

14. STANLY, Edward, and EVANS, Alexander. *Report to the House of Representatives of the United States of America, vindicating the rights of Charles T. Jackson to the discovery of the anæsthetic effects of ether vapor, and disproving the claims of W. T. G. Morton to that discovery*. [Boston, Rand, Avery & Frye, 1852?]

VI. SIR JAMES Y. SIMPSON AND CHLOROFORM

THE story of Simpson's discovery of chloroform is even more colorful than that of ether, and is well told in the words of his biographer, H. Laing Gordon:

Simpson speedily showed that no evil resulted if the patient remained under the influence of the [ether] vapour for hours. In the month of January, 1847, he gained for the Edinburgh Medical School the proud honour of being the scene of the first use of anæsthetics in obstetric practice. In March of the same year he published a record of cases of parturition in which he had used ether with success [VII. 142]; and had a large number of copies of his paper printed and distributed far and wide at home and abroad, so eager was he to popularise amongst the members of his profession the revolutionary practice which he introduced. . . . He quickly perceived, however, the shortcomings of ether, and having satisfied himself that they were unavoidable, he set about his next great step, namely, to discover some substance possessing the advantages without the disadvantages of ether. In the midst of his now immense daily work he gave all his spare time, often only the midnight hours, to testing upon himself the effect of numerous drugs. With the same courage that had filled Morton he sat down alone, or with Dr. George Keith and Dr. Matthews Duncan, his assistants, to inhale substance after substance, often to the real alarm of the household at 52, Queen Street . . . but the summer of 1847 passed away, and the autumn was commenced before he succeeded in finding any substance which at all fulfilled his requirements. . . .

The suggestion to try chloroform first came from a Mr. Waldie, a native of Linlithgowshire, settled in Liverpool as a chemist. It was a 'curious liquid,' discovered and described in 1831 by two chemists, Soubeiran and Liebig, simultaneously but independently. In 1835 its chemical composition was first accurately ascertained by Dumas, the famous French chemist. . . . How it finally came to be tried is best described in the words of Simpson's colleague and neighbour, Professor Miller, who used to look in every morning at nine o'clock to see how the enthusiasts had fared in the experiments of the previous evening.

"Late one evening, it was the 4th of November, 1847, on returning home after a weary day's labour, Dr. Simpson with his two friends and assistants, Drs. Keith and Duncan, sat down to their somewhat hazardous work in Dr. Simpson's dining-room. Having

inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material which he had formerly set aside on a lumber-table, and which on account of its great weight he had hitherto regarded as of no likelihood whatever; that happened to be a small bottle of chloroform. It was searched for and recovered from beneath a heap of waste paper. And with each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party—they became brighteyed, very happy, and very loquacious—expatiating on the delicious aroma of the new fluid. The conversation was of unusual intelligence, and quite charmed the listeners—some ladies of the family and a naval officer, brother-in-law of Dr. Simpson. But suddenly there was talk of sounds being heard like those of a cotton mill louder and louder; a moment more and then all was quiet—and then crash! On awakening Dr. Simpson's first perception was mental—'This is far stronger and better than ether,' said he to himself. His second was to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm. Hearing a noise he turned round and saw Dr. Duncan beneath a chair—his jaw dropped, his eyes staring, his head bent half under him, quite unconscious, and snoring in a most determined and alarming manner. More noise still and much motion. And then his eyes overtook Dr. Keith's feet and legs making valorous attempts to overturn the supper table, or more probably to annihilate everything that was on it. By and by Dr. Simpson having regained his seat, Dr. Duncan having finished his uncomfortable and unrefreshing slumber, and Dr. Keith having come to an arrangement with the table and its contents, the *sederunt* was resumed. Each expressed himself delighted with this new agent, and its inhalation was repeated many times that night—one of the ladies gallantly taking her place and turn at the table—until the supply of chloroform was fairly exhausted."

The lady was Miss Petrie, a niece of Mrs. Simpson's; she folded her arms across her breast as she inhaled the vapour, and fell asleep crying, 'I'm an angel! Oh, I'm an angel!'

Original Papers

VI. 1.

NEW ANÆSTHETIC AGENT

Edinburgh, 15 Nov. 1847.

Title: Account | of a | new anæsthetic agent, | as a | substitute
for sulphuric ether | in | surgery and midwifery. | By | J. Y.
Simpson, M.D., F.R.S.E., | Professor of Midwifery in the Uni-

versity of Edinburgh; | Physician-Accoucheur to the Queen in Scotland, etc. | [motto] | [half-rule] | Communicated to the Medico-Chirurgical Society of Edinburgh, | at their meeting on 10th November 1847. | [half-rule] | Edinburgh: | Sutherland and Knox, Princes Street. | London: Samuel Highley, 32 Fleet Street. | [short rule] | MDCCCXLVII.

Collation: 8°. A⁸, B⁴; 23 pp.

Contents: p.[1] title; p.[2] 'Murray and Gibb, Printers, Edinburgh'; p.[3] dedication to M. J. Dumas; p.[4] blank; pp.[5]-18 text of paper as read on 10 November; pp. 18-23 postscript dated 'Edinburgh, 15th November 1847.'

Note: Simpson had discovered the narcotic effects of chloroform on the evening of 4 November. Six days later he gave this celebrated report, which he had printed between the 10th and the 15th. With a title beginning "Notice," it was first issued on 12 November without the postscript (see Osler catalogue No. 1479). According to H. Laing Gordon, four thousand copies of the 15 November paper were sold in the Edinburgh book stalls within "a few days and many thousands afterwards." In the Postscript of the fifteenth, Simpson states that he had already administered chloroform to some fifty individuals without the slightest bad result. This tract was many times reprinted in England and in the United States, and an abstract of it appeared in *The Lancet* for 20 November 1847 (pp. 549-550). The later reprints are dated 1848, and a description of the first and third American editions follows.

VI. 2.

NEW ANÆSTHETIC AGENT, 1st Amer. ed. *New York*, 1 Jan. 1848.

Title: [Same as No. 1 save for imprint] *New York*: | Republished by Rushton, Clark, & Co., | chemists and druggists, | 1848.

Cover title: Same as title save for being in ornamental border and the addition of '110 Broadway, and 10 Astor House' above the date of imprint.

Collation: 8°. 1⁴, 2⁸; 24 pp.

Contents: p.[1] title; p.[2] dedication 'To the Medical Faculty of the United States'; p.[3] 'Preface to the American edition' dated 1 January 1848; p.[4] blank; p.[5] 'Inscribed to M. J. Dumas'; p.[6] blank; p.[7]-19 text; pp. 19-24 Postscript.

Note: Messrs. Rushton, Clark, & Co., *New York* chemists, reprinted the Simpson paper several times, with only one side-long glance toward their own interests. The last three lines of p.[3] read: "N.B. Rushton, Clark, & Co. take this opportunity of apprising Physicians that they have a supply of pure Chloroform and Inhaling Ether constantly on hand."

Copy: Kindly loaned by Mr. and Mrs. Charles A. Simpson of Northford, Connecticut, the copy having formerly belonged to Jared Linsly, M.D. (Yale, B.A. 1826).

VI. 3.

NEW ANÆSTHETIC AGENT, 3rd Amer. ed. *New York*, 1848.

Title: Simpson on chloroform. | wavy rule | An| Account| of a
| new anæsthetic agent, [etc., as in 1st Amer. ed.] . . . | Third
American edition. | New York: | Republished by Rushton,
Clark, & Co., | chemists and druggists, | 110 Broadway, and
10 Astor House. | 1848.

Cover title: Same as title, but within ornamental border.

Collation: 8°. 1-28; 32 pp.

Contents: p.[1] title; p.[2] Dedication; p.[3] Preface to the American edition (and second edition); p.[4] Preface to the third American edition; pp.[5]-22 text; pp. 23-32 Appendix containing 'additional cases of the use of chloroform, reported by Dr. Simpson' and 'St. Bartholomew's Hospital. Surgical cases treated at this hospital'; also Testimonials (pp. 30-32) from Valentine Mott, Willard Parker, A. E. Hosack, etc.

Note: Messrs. Rushton, Clark, & Co. continue to refer on p.[3] to their supply of chloroform and ether, adding here the phrase "at the lowest prices."

VI. 4.

DISCOVERY OF NEW AGENT

London, 22 Nov. 1847.

Title: Discovery of a new | anæsthetic agent, | more efficient
than sulphuric ether. | By J. Y. Simpson, M.D. | Professor of
Midwifery in the University of | Edinburgh; Physician-Ac-
coucheur to Her | Majesty in Scotland, &c.&c. *London Medi-
cal Gazette*, 26 Nov. 1847, n.s.5, 934-937.

Note: Simpson's second report on chloroform, dated 22 November and thus written eighteen days after the original discovery. In a footnote on p. 935 he states that he had now given chloroform to "above eighty individuals, and in not one case has the slightest bad effect of any kind resulted." This appears not to have been reprinted.

VI. 5.

SUPERINDUCTION OF ANÆSTHESIA

Edinburgh, 1 Dec. 1847.

Title: Remarks | on the | superinduction of anæsthesia | in |
natural and morbid parturition: | with | cases illustrative of
the use and effects of | chloroform in obstetric practice. | By
| J. Y. Simpson, M.D., F.R.S.E., | Professor of Midwifery in
the University of Edinburgh, and | Physician-Accoucheur
to Her Majesty in Scotland. | [7 lines of quotations] | Edin-

burgh: | Sutherland and Knox, 58, Princes Street. | London:
Samuel Highley, 32, Fleet Street | [brief rule] | MDCCCXLVII.

Collation: 8°. A^s, B¹; 24 pp.

Contents: [A]_{1a} title; [A]_{1b} 'Murray and Gibb, Printers, Edinburgh'; [A]_{2a}-B_{4b} (pp.[3]-24) text.

Note: 'Read to the Medico-Chirurgical Society, of Edinburgh, at their meeting on the 1st December, 1847.' There are at least three separate printings of this tract, the second (Osler 1458) with 'The end' on p. 24, another (Osler 1459) without this phrase and evidently printed before Osler No. 1458 (Dr. W. W. Francis), and a third (Osler 1460) with 'the second thousand' on the title. An abstract of this paper appeared in *The Lancet* for 11 December 1847 (pp. 623-626).

Copy: Photostat from Osler Library, McGill University.

VI. 6.

SUPERINDUCTION OF ANÆSTHESIA + APPENDIX *Boston*, 1848.

Title: [Same as preceding through quotations] | [short rule] |
with an appendix. | [short rule] | Boston: | Published by Wil-
liam B. Little & Co., | Chemists and druggists, | 104 Han-
over, Corner of Salem Street. | 1848.

Cover title: Same as title but within line border.

Collation: 8°. 48 pp.

Contents: p.[1] title; p.[2] 'White & Potter, Printers, Spring Lane, Boston.'; p.[3] 'Preface to the Boston edition' dated 1 February 1848; p.[4] blank; p.[5] dedica-
tion to 'John C. Warren, M.D. . . . with the respects of the publishers'; p.[6]
blank; pp.[7]-27 text; p.[28] blank; pp.[29]-48 Appendix (testimonials).

Note: The Appendix starts with a long letter from J. C. Warren on the chemical nature and synthesis of chloroform and is followed by other letters from Boston surgeons contrasting chloroform with ether. Their reception of chloroform was at first enthusiastic. The back cover carries a print of the W. B. Little & Co. premises at 104 Hanover Street (corner of Salem).

VI. 7.

ANSWER TO RELIGIOUS OBJECTIONS *Edinburgh*, Dec. 1847.

Title: Answer | to | the religious objections | advanced against
| the employment of anæsthetic agents | in midwifery and
surgery. | By | J. Y. Simpson, M.D., F.R.S.E., | Professor of
Midwifery in the University of Edinburgh, and Physician-
Accoucheur to Her Majesty in Scotland. | [Tags of Scripture]
| Edinburgh: | Sutherland and Knox, 58, Princes Street. |
London: Samuel Highley, 32, Fleet Street. | [brief rule] |
MDCCCXLVII.

Collation: 8°. 23 pp.

Contents: p.[1] title; p.[2] 'Murray and Gibb, Printers, Edinburgh.'; pp.[3]-23 text; p.[24] blank.

Note: This, the original edition, is very rare, the second edition of 1848 being more common. Shortly after the publication of his *Remarks on the superinduction of anæsthesia*, 1847, Simpson published this paper in answer to some criticism by his 'professional brethren in Scotland.' Laing Gordon writes: "The same kind of bigotry had met the introduction of vaccination, and Simpson himself remembered how many people had opposed the emancipation of the negroes on the ground that they were the lineal descendants of Ham, of whom it was said 'a servant of servants shall he be unto his brethren.'" In this famous pamphlet "he fought his enemies with their own weapons by appealing with consummate skill to Scripture for authority for the practice, sweeping the ground from under his opponents' feet by reference to and study of the original Hebrew text."

VI. 8.

ANÆSTHETIC MIDWIFERY

Edinburgh, 1848.

Title: Anæsthetic midwifery: | report | on its | early history and progress. | By | J. Y. Simpson, M.D., | Professor of Midwifery in the University of Edinburgh. | —"I do think you might spare her, | And neither heaven nor man grieve at the mercy." | *Measure for Measure.* | Edinburgh: | Sutherland and Knox, George Street. | [short rule] | MDCCCXLVIII.

Collation: 8°. 54 pp.

Contents: p.[1] title; p.[2] 'From the Monthly Journal of Medical Science, October 1848'; p.[3] dedication to Charles J. Hambro; p.[4] blank; pp.[5]-47 text; p.[48] blank; pp.[49]-51 Appendix; p.[52] blank; pp.[53]-54 Index.

Note: Scottish medical historians point with pride to the fact that anesthesia in midwifery originated north of the Tweed. Simpson had published his first paper on the use of ether in childbirth in March of 1847, and this represents his first general treatise on the subject in which the relative virtues of ether, chloroform, and nitrous oxide are appraised.

VI. 9.

SIMPSON'S WORKS. Vol. 2, ANÆSTHESIA

Edinburgh, 1871.

Title (vol. 2): Anæsthesia, hospitalism | hermaphroditism | and a | proposal to stamp out small-pox and | other contagious diseases | by | Sir James Y. Simpson, Bart. | M.D. D.C.L. | Late Professor of Midwifery in the University of Edinburgh | Edited by | Sir W. G. Simpson, Bart., B.A. | Scholar of Gonville and Caius Coll. Cambridge | Edinburgh | Adam and Charles Black | 1871 | (*The right of translation reserved.*)

Half-title: The works | of | Sir James Y. Simpson, Bart. | Vol-
ume II.

Collation (vol. 2): 8°. x, 562 pp., 2 ll.

Contents: p.[i] half title; p.[ii] blank; p.[iii] title; p.[iv] 'Printed by R. Clark, Edinburgh'; pp.[v]-vi Preface; pp.[vii]-x Contents; pp.[1]-288 Anæsthesia; pp. [289]-405 Hospitalism; pp. [407]-542 Hermaphroditism; pp.[543]-553 Proposal to stamp out small-pox; p.[554] blank; pp.[555]-560 Index; pp.[561]-562 Index to original sources; pp.[1]-4 advt.s.

Note: The year following its appearance in Great Britain, this volume was issued in New York by D. Appleton and Company. The text appears to have been reset throughout as the lettered signatures have been replaced by numbered signatures (in 8's). The half-title carries the notation, Volume II.

Biography and Commentary

VI.

10. BALLANTYNE, J. W. Obstetrics and gynecology. *Edinb. med. J.*, 1911, 6, 602-605.

11. BARBOUR, A. H. F. Simpson as gynecologist. *ibid.*, 534-542.

12. BARNES, Robert. Observations on Dr. Simpson's anæsthetic statistics. *Lancet*, 25 Dec. 1847, 2, 677-678.

13. *Chair of midwifery. Testimonials in favour of James Y. Simpson, M.D.* Edinburgh, Thomas Allan & Co., 1839. 80 pp.

14. *Chair of midwifery in the University of Edinburgh. Testimonials [etc.]* Edinburgh, Thomas Allan & Co., 1840. xv, 134 pp.

15. COMRIE, J. D. James Young Simpson (1811-1870). *Med. Pr.*, 1934, 137, 120-122.

16. CROOM, Sir Halliday. Sir James Simpson's influence on the progress of obstetrics. *Edinb. med. J.*, 1911, 6, 523-533.

17. DUNS, John. *Memoir of Sir James Y. Simpson, Bart.* Edinburgh, Edmonston and Douglas, 1873. xiv, 544 pp.

18. EDINBURGH MEDICAL JOURNAL. Sir James Y. Simpson centenary number.

Edinburgh and London, W. Green & Sons, 1911. 2 ll., 481-615 pp.

19. EDINBURGH. Theatre Royal. [Four playbills, dated Dec. 30, 1847, Jan. 15, 24, and 28, 1848, listing among the attractions "Doctor Chloroform's establishment, and pawnbroker's shop."]

20. GIRDNER, J. H. Chloroform—its uses and dangers. The drug discovered by Sir James Simpson. *Munsey's Mag.*, July 1902, 27, 501-502.

21. GORDON, H. L. *Sir James Young Simpson and chloroform (1811-1870)*. New York, Longmans, Green & Co., 1897. xii, 233 pp.

22. HART, D. B. James Young Simpson. An appreciation of his work in anæsthesia and of some of his outstanding papers. *Edinb. med. J.*, 1911, 6, 543-553.

23. SIMPSON, Sir A. R. Memories of Sir James Simpson. *Edinb. med. J.*, 1911, 6, 491-515.

24. SIMPSON, Eve Blantyre. Sir James Y. Simpson. *ibid.*, 482-490.

25. — Sir James Simpson's introduction of chloroform. By his daughter. *Century Mag.*, 1894, 47, 412-420.

VII. OTHER STUDIES ON INDIVIDUAL SURGICAL ANESTHETICS (to 1875)

MEDICAL journals throughout the world during 1847 and 1848 became flooded with reports about the use of ether and in 1848 about chloroform. The *Boston Medical and Surgical Journal* had eighteen papers and letters about ether in 1846, *i.e.*, between 28 October when E. R. Smilie reported on his use of a tincture of ether and opium by inhalation and the number for 30 December which contained four ether reports. *The Lancet* in London began publishing on the subject on 2 January 1847, and the French journals on 12 January. It is not feasible here to list all of the anesthesia literature that appeared between 1846 and 1875 (much of it will be found in the *Index-Catalogue of the Surgeon General's Office*), so we have concentrated primarily on the literature of the first two years, *i.e.*, 1847 and 1848, but we have included anything we possess as separates up to 1875. Titles preceded by an asterisk are represented in photostat.

Opiates

1. CLOUGH, John. Ethereal tincture of opium. *Boston med. surg. J.*, 16 June 1847, 36, 406-407.
2. DAURIOL. A substitute for the vapor of ether to annul sensation during operations. *Lancet*, 22 May 1847, 1, 540. Also *Boston med. surg. J.*, 30 June 1847, 36, 448.
3. SMILIE, E. R. Inhalation of the ethereal tincture of opium. *Boston med. surg. J.*, 5 May 1847, 36, 281-282.
4. — Insensibility produced by the inhalation of the vapor of the ethereal solution of opium. *Boston med. surg. J.*, 28 Oct. 1846, 35, 263-264.

Nitrous Oxide

5. BOSTON MEDICAL AND SURGICAL JOURNAL. Editorials. Vol. 36, Feb.-July 1847.

Inhalation of gases in surgical operations: pp. 243-244.

Sir Humphrey [*sic*] Davy on the use of narcotic vapors in mitigating pain: p. 348.

6. ELLSWORTH, P. W. Amputation of the thigh under the influence of the nitrous oxide gas. *Boston med. surg. J.*, 19 Jan. 1848, 37, 498-499.

7. MARCY, E. E. Removal of a large scirrhus testicle from a man while under the influence of nitrous oxide gas. *Boston med. surg. J.*, 1 Sept. 1847, 37, 97-99.

8. MELLE, G. W. F. Nitrous oxide gas in asphyxia. *Boston med. surg. J.*, 15 Sept. 1847, 37, 139-140.

9. ZIEGLER, G. J. *Researches on the medical properties and application of nitrous oxide, protoxide of nitrogen,*

or laughing gas. Philadelphia, J. B. Lippincott, 1865. 66 pp.

Mesmerism

10. DANA, Fras. Jr. Mesmerism. *Boston med. surg. J.*, 23 Dec. 1846, 35, 425-428.

11. [DURAND and LOYSEL.] Magnétisme. Insensibilité absolue produite un moen du sommeil magnétique. Trois nouvelles opérations chirurgicales pratiquées à Cherbourg, le 4 juin 1847, en présence de plus de soixante persons. *J. de Cherbourg et Phare de la Manche*, 13 juin 1847. (Separate: Cherbourg, Beaufort et Lecauf, 8 pp.)

12. HALL, C. R. On the effects of ether inhalation in reference to mesmerism. *Lancet*, 24 April 1847, 1, 436-437.

Sulphuric Ether

13. 'A.' Discovery of the effects of ether. *Boston med. surg. J.*, 12 May 1847, 36, 297-298.

13a. ALLAN, Robert. The spasms of hydrophobia temporarily relieved by the inhalation of the vapour of sulphuric ether. *Lancet*, 16 Oct. 1847, 2, 409-410.

14. ALLEN, J. A. Inhalation of sulphuric ether, with practical remarks. *Boston med. surg. J.*, 10 March 1847, 36, 116-119.

15. *AMUSSAT. Observations relatives aux effets de l'inhalation de l'éther sur les animaux et sur l'homme. *C. R. Acad. Sci., Paris*, 22 Feb. 1847, 24, 284-285.

16. *— Nouvelles observations sur les effets que produit, chez les animaux, l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 1 March 1847, 24, 365.

17. *—Effets de l'inhalation de l'éther sur des foetus contenus dans l'utérus. *C. R. Acad. Sci., Paris*, 8 March 1847, 24, 384.

See also VII. 40.

18. B., T. E. Insensibility produced by ethereal inhalation. *Boston med. surg. J.*, 30 Dec. 1846, 35, 445-448.

19. BALLARD, Edward. Etherization in medical practice. *Lancet*, 23 Oct. 1847, 2, 440-443.

20. BANNISTER, C. Hobbies—the Boston Medical and Surgical Journal—Successful use of ether in neuralgia. *Boston med. surg. J.*, 24 May 1848, 38, 345-347.

21. *BAUDENS. Sur l'emploi de l'inhalation des vapeurs éthérées comme moyen de distinguer les affections simulées des affections réelles. *C. R. Acad. Sci., Paris*, 8 March 1847, 24, 382-383.

22. BEALE, S. T. *Trial and conviction of Dr. Stephen T. Beale . . . Interesting ether cases . . .* Philadelphia, T. K. Collins, Jr., 1855. 30 pp.

23. BEMIS, J. W. Inhalation of ether in labor. *Boston med. surg. J.*, 21 July 1847, 36, 497-498.

24. *BESSERON. De l'emploi des inspirations d'éther dans le traitement de la méningite cérébrospinale. *C. R. Acad. Sci., Paris*, 24 May 1847, 24, 897.

25. BICELOW, H. J. Insensibility during surgical operations produced by inhalation. *Boston med. surg. J.*, 9 Dec. 1846, 35, 379-382.

26. — Alleged death from ether. n.p., n.d., 10 pp. (With his *Ether and chloroform*, VII. 192.)

27. — Etherization — a compendium of its history, surgical use, dangers, and discovery. *Boston med. surg. J.*, 19 April 1848, 38, 229-237; 254-266.

28. BIGELOW, J. Discovery of etherism—the question settled. *Boston med. surg. J.*, 7 July 1847, 36, 464-465.

BLANDIN. See VII. 40.

29. BOSTON MEDICAL AND SURGICAL JOURNAL. Editorials. Vol. 35, Aug. 1846-Jan. 1847.

Operations without pain: p. 324
Insensibility during surgical operations produced by inhalation: pp. 413-414

Apparatus for inhaling the new gas: p. 440

- "N. Y. Correspondence." Letheon in New York: p. 442; Insensibility during surgical operations: p. 464
- "N. Y. Journal of Medical and Colateral Sciences." Insensibility during surgical operations by inhalation: pp. 518-519
- "N. Y. Correspondence." Letheon in New York: pp. 520-522
- Insensibility by inhalation of the letheon: p. 542.
30. — *Vol. 36, Feb.-July 1847*
 The letheon in London: p. 26
 Mr. Liston on the respiration of sulphuric ether: p. 47
 Value of the ethereal inhalation: p. 48
 The ether inhalation in London: p. 88
 Use of the letheon in London: pp. 96-101
 Surgical operations after ethereal inhalation: p. 126
 Insensibility to pain from a hot iron: p. 127
 Inhalation of sulphuric ether vapor: p. 148
 Ethereal intoxication: p. 183
 Discovery of the effects of ether [R. H. Collyer's claim]: p. 187
 Ether in the passage of gravel: p. 205
 Insensibility during surgical operations: p. 207
 Inhalation of sulphuric ether in surgical operations: p. 228
 Employment of sulphuric ether vapor in Montreal, Quebec, and Sherbrooke: p. 228
 The ether in Europe: p. 266
 Inhalation of ether: p. 288
 Practical application of ether to medical jurisprudence, to distinguish feigned from real disease: p. 367
 Pamphlet war-discovery of the effects of ethereal inhalation: p. 403
 A review of Dr. Gay's statement: p. 442
 Ethereal inhalation: p. 465
 Inhalation of ether in labor: p. 466
 Traumatic tetanus; inhalation of ether: p. 468.
31. — *Vol. 37, Aug. 1847-Jan. 1848*
 Letheon controversy: pp. 25-26
 Ether in pregnancy: p. 87
 Laryngismus stridulus; inhalation of ether: p. 88
- Proper mode of administering sulphuric ether: p. 185
 Ether in mania: pp. 206-207
 Ether in childbirth: p. 264
 Etherization at the N. Y. Hospital: p. 346
 Etherization in Philadelphia: p. 404
 Etherization with surgical remarks: p. 486
 Anæsthetic agents in midwifery and surgery: p. 524.
32. — *Vol. 38, Feb.-July 1848*
 The Living Age: p. 165
 Defence of Dr. Jackson's claims to the discovery of etherization: p. 389
 The ether controversy: p. 429
 Vindication of the Hospital report: p. 469
 Present to Dr. Morton: p. 469.
33. BOSTON SOCIETY FOR MEDICAL IMPROVEMENT. *Report of a committee . . . on the alleged dangers which accompany the inhalation of the vapor of sulphuric ether.* Boston, D. Clapp, 1861. 36 pp.
34. *BOURGET. Observations de luxation de l'épaule, réduite avec facilité sous l'influence des inhalations d'éther. *C. R. Acad. Sci., Paris*, 8 March 1847, 24, 385-386.
35. *BOUTIGNY, P. Vues théoriques sur l'éthérisation. *C. R. Acad. Sci., Paris*, 13 Dec. 1847, 25, 904.
36. *BOUVIER. Effets de l'inhalation de l'éther. With discussion by Hutin, Tavernier, and others. *C. R. Acad. Sci., Paris*, 8 Feb. 1847, 24, 200-204. See also VII. 40.
37. BROWN, Buckminster. On the pathological and physiological effects of ethereal inhalation. *Boston med. surg. J.*, 9 June 1847, 36, 369-378.
38. — — — With an appendix, containing an additional case and experiments. Boston, D. Clapp, 1847. 17 pp.
39. BRYANT, Henry. Inhalation of ether in Paris. *Boston med. surg. J.*, 16 June 1847, 36, 389-391.

40. *BULLETIN DE L'ACADEMIE ROYALE DE MEDECINE, PARIS. Vol. 12, 1846-1847. *Suite de la discussion sur les effets de l'éther sulfurique.*
- 26 Jan. 1847, 301-310 (Honoré, Boulay, Chevallier, Renault, Rochoux, Gerdy, Roux, Velpeau, Laugier) Third detailed discussion of French experience with ether at the Royal Academy of Medicine
- 2 Feb., 314-327 (Jobert, Blandin, Bouvier, Ferrus, Renault, Roux, Malgaigne, Orfila, Oudet)
- 9 Feb., 348-371 (Cloquet, Gerdy [350-356], Amussat [356-361], Longet [361-371])
- 16 Feb., 375-382 (Jobert, Renault, Amussat, Lallemand, Piorry, Velpeau)
- 23 Feb., 401-411 (Dubois [400-408])
- 9 March, 453-456 (Bouvier)
- 23 March, 505-519 (Blandin)
- 30 March, 527-532 (Blandin, Velpeau, Roux).
41. *CARDAN, J. Effets produits sur une femme enceinte par l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 8 March 1847, 24, 385.
42. *CHAILLY-HONORÉ. Sur l'inhalation des vapeurs d'éther dans la pratique des accouchements. *Bull. Acad. Méd. Paris*, 9 March 1847, 12, 442-445.
43. CHAMBERS, Richard. Observations on the inhalation of ether. *Lancet*, 17 April 1847, 1, 405-406.
44. *CHAMBERT, Henri. *Des effets physiologiques et thérapeutiques des éthers.* Paris, J. B. Baillière, 1848. 260 pp.
45. CHANNING, Walter. A case of inhalation of ether in instrumental labor. *Boston med. surg. J.*, 19 May 1847, 36, 313-318.
46. — Inhalation of ether in a case of laborious labor. *Boston med. surg. J.*, 26 May 1847, 36, 335-337.
47. — Cases of inhalation of ether in labor. *Boston med. surg. J.*, 24 June 1847, 36, 415-419.
48. — Six cases of inhalation of ether in labor. Boston, White & Potter, 1847. 35 pp.
49. CLARK, Jonathan. Inhalation of ether in labor. *Boston med. surg. J.*, 13 Oct. 1847, 37, 214-216.
50. 'CLAUDIAN.' The patent "Letheon." *Boston med. surg. J.*, 20 Jan. 1847, 35, 514.
- CLOQUET. See VII. 40.
51. COMSTOCK, W. W. Dr. Jackson's review of Dr. Gay's statement. *Boston med. surg. J.*, 14 July 1847, 36, 481-482.
52. COOTE, H. and TAYLOR, T. Experiments illustrating the effects produced by the inhalation of ether upon the lower vertebrate animals. *Lancet*, 19 June 1847, 1, 644-645.
53. Correspondence reviewing the discovery of the application of ether to surgical operations. Letters from Henry Bennet, P. W. Ellsworth, Horace Wells (reprinted from *Calignani's Messenger*, Paris, 18 Feb. 1847), and E. E. Marcy. *Lancet*, 6 March and 1 May 1847, 1, 265-267; 471-474.
54. COX, A. L. Experiments with the letheon in New York. *Boston med. surg. J.*, 30 Dec. 1846, 35, 456-459.
55. DEANE, James. Respiration of ethereal vapor. *Boston med. surg. J.*, 1 Dec. 1847, 37, 354-356.
56. *DESCHAMPS. Note sur l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 5 April 1847, 24, 610-612.
57. *DOYÈRE. Recherches sur le dosage des vapeurs d'éther dans les inhalations. *C. R. Acad. Sci., Paris*, 15 March 1847, 24, 425-426.
58. *— Étude physique et physiologique de l'éthérisation. — Premier Mémoire: Étude des appareils le plus généralement en usage actuellement dans la pratique chirurgicale. *C. R. Acad. Sci., Paris*, 19 April 1847, 24, 695-696.
59. *DUBOIS. De l'application de l'inhalation de l'éther aux accouchements. *Bull. Acad. Méd. Paris*, 23 Feb. 1847, 12, 400-411. See also VII. 40.

60. DUBOIS, Paul. On the inhalation of ether applied to cases of midwifery. *Lancet*, 6 March 1847, 1, 246-249.
61. DUDLEY, Thomas. Alleged discovery of the influence of sulphurous ether in 1824. *Lancet*, 6 Feb. 1847, 1, 163.
62. *DUFAY. Recherches expérimentales et théoriques sur l'éthérisation. *C. R. Acad. Sci., Paris*, 5 April 1847, 24, 608-610.
63. ELLSWORTH, P. W. The discoverer of the effects of sulphuric ether. *Boston med. surg. J.*, 16 Dec. 1846, 35, 397-398.
64. — Ethereal inhalation—Dr. Wells's claims as discoverer. *Boston med. surg. J.*, 4 Aug. 1847, 37, 14-18.
65. FAIRBROTHER, Alex. The fatal administration of ether to Mrs. Parkinson. *Lancet*, 3 April 1847, 1, 370.
66. FISHER, F. W. The ether inhalation in Paris. *Boston med. surg. J.*, 10 March 1847, 36, 109-113.
67. — Letter from Paris—ethereal inhalation in insanity and obstetrics. *Boston med. surg. J.*, 31 March 1847, 36, 172-174.
68. FLAGG, J. F. The inhalation of an ethereal vapor to prevent sensibility to pain during surgical operations. *Boston med. surg. J.*, 2 Dec. 1846, 35, 356-359.
69. — Inhalation of sulphuric ether. *Boston med. surg. J.*, 16 Dec. 1846, 35, 407-409.
70. *FLOURENS. Note touchant les effets de l'inhalation éthérée sur la moelle épinière. *C. R. Acad. Sci., Paris*, 8 Feb. 1847, 24, 161-162.
71. * — Note touchant les effets de l'inhalation de l'éther sur la moelle allongée. [With discussion by Magendie and Balard.] *C. R. Acad. Sci., Paris*, 22 Feb. 1847, 24, 254-259.
72. * — Note touchant l'action de l'éther sur les centres nerveux. [With remarks by Roux and Despretz.] *C. R. Acad. Sci., Paris*, 8 March 1847, 24, 340-347.
73. * — Note touchant l'action de l'éther injecté dans les artères. *C. R. Acad. Sci., Paris*, 22 March 1847, 24, 482-485.
74. GARDNER, J. On ether-vapour, its medical and surgical uses. *Lancet*, 3 April 1847, 1, 349-354; 24 April 1847, 1, 431-434.
75. — Priority of discovery of the use of ether vapor. *Boston med. surg. J.*, 26 May 1847, 36, 333-335.
76. *GERDY. Observations sur l'influence de la respiration de l'éther. *C. R. Acad. Sci., Paris*, 25 Jan. 1847, 24, 125-128.
77. * — Deuxième communication sur l'inhalation éthérée. *C. R. Acad. Sci., Paris*, 22 Feb. 1847, 24, 280-284.
See also VII. 40.
78. GIBSON, W. Mr. Liston, of London. *Boston med. surg. J.*, 8 Dec. 1847, 37, 382-383.
79. GORE, H. J. Experiments on the state of the blood in etherization. *Lancet*, 31 July 1847, 2, 138.
80. *GRUBY. Tableaux et conclusions des expériences faites sur l'inspiration des vapeurs d'éther chez les animaux. *C. R. Acad. Sci., Paris*, 8 Feb. 1847, 24, 192-194.
81. H., A. S. Ethereal gas in Rutland County, Vermont. *Boston med. surg. J.*, 10 Feb. 1847, 36, 40-41.
82. HAYWARD, George. Some account of the first use of sulphuric ether by inhalation in surgical practice. *Boston med. surg. J.*, 21 April 1847, 36, 229-234.
83. — — [Boston, 1847.] 8 pp.
84. — *Remarks on the comparative value of the different anæsthetic agents.* Boston, D. Clapp, 1850. 11 pp.
85. HEARNE, Edwin. On ether-vapour, and the fatal case of Mrs. Parkinson. *Lancet*, 22 May 1847, 1, 533-535.

86. HONORÉ. [Use of ether in facial neuralgia.] *Bull. Acad. Méd. Paris*, 2 Feb. 1847, 12, 313-314. See also VII. 40.
87. HOSACK, A. E. *Cases illustrative of the beneficial effects, of ether.* New York, G. F. Nesbitt, 1847. 8 pp. Also *Boston med. surg. J.*, 11 Aug. 1847, 37, 29-33.
88. *HOSSARD. Comparaison des effets produits par l'inhalation des vapeurs éthérées et de l'acide carbonique. *C. R. Acad. Sci., Paris*, 22 March 1847, 24, 491-492.
- JOBERT. See VII. 40.
89. *JOLY. Effets produits par l'inhalation de l'éther; expériences faites sur lui-même. *C. R. Acad. Sci., Paris*, 1 March 1847, 24, 360-363.
90. KEEP, N. C. Inhalation of ethereal vapor for mitigating human suffering in surgical operations and acute diseases. *Boston med. surg. J.*, 7 April 1847, 36, 199-201.
91. — The letheon administered in a case of labor. *Boston med. surg. J.*, 14 April 1847, 36, 226.
92. KIMBALL, HORACE. Use of the letheon — seventeen teeth extracted. *Boston med. surg. J.*, 13 Jan. 1847, 35, 489-490.
93. *LALLEMAND. Sur les inconvénients que peut avoir, dans certains cas chirurgicaux, l'insensibilité déterminée par l'inhalation de l'éther. [With comment by Serres.] *C. R. Acad. Sci., Paris*, 1 Feb. 1847, 24, 150-152. See also VII. 40.
94. THE LANCET. Editorials. 16 Jan. 1847, 1, 74-75; 18 Dec. 1847, 2, 660.
95. — *Operations without pain.* 16 Jan.-22 May 1847, 1, 77-80; 104-107; 132-135; 158-161; 184-188; 210-212; 237-239; 342-344; 367-368; 499-500; 546.
96. *LANDOUZY, H. Sur les vapeurs d'éther. *Bull. Acad. Méd. Paris*, 26 Jan. 1847, 12, 299-301.
97. *LANSDOWN, J. G. On the use of ether in natural labour. *Lancet*, 5 June 1847, 1, 584-585. Also *Boston med. surg. J.*, 11 Aug. 1847, 37, 48.
98. *LASSAIGNE. Quelques observations physico-chimiques sur le mélange de la vapeur d'éther dans l'air, suivis de l'analyse du sang veineux avant et après l'expérience. *Bull. Acad. Méd. Paris*, 9 March 1847, 12, 445-452.
99. * — Résultats obtenus en examinant, sous le point de vue chimique, le sang veineux d'un animal avant et après l'inhalation de l'air chargé de vapeurs d'éther. *C. R. Acad. Sci., Paris*, 1 March 1847, 24, 359-360.
100. *LAUGIER. Observations relatives aux effets produits par l'inhalation de l'éther sulfurique. *C. R. Acad. Sci., Paris*, 25 Jan. 1847, 24, 123-125.
101. * — Nouvelles observations sur les effets de l'inhalation de l'éther pendant les opérations chirurgicales. *C. R. Acad., Sci., Paris*, 22 Feb. 1847, 24, 276-280. See also VII. 40.
102. *LEMAITRE. Action de l'éther inhalé pour prévenir un accès d'épilepsie. *C. R. Acad. Sci., Paris*, 5 April 1847, 24, 612-613. Additional note, *Ibid.*, 14 June 1847, 1053.
- LONGET. See VII. 40.
103. *LÜER. Nouvel appareil pour l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 12 April 1847, 24, 652-653.
104. *MAISSIAT. Note sur deux instruments d'éthérisation. *C. R. Acad. Sci., Paris*, 12 April 1847, 24, 649.
105. *MALGAIGNE, J. F. Emploi de l'éther. With discussion. *Bull. Acad. Méd. Paris*, 12 and 19 Jan. 1847, 12, 262-264; 283-285. (First and second reports on ether in France.)
See also VII. 40.
106. *MALLE. Sur les vapeurs éthérées. *Bull. Acad. Méd. Paris*, 2 March 1847, 12, 413-417.
107. *MANDEL. Nouveaux faits observés sur des animaux soumis à l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 1 March 1847, 24, 366.

108. MANSFIELD, J. D. The inhalation of ethereal vapor, &c. *Boston med. surg. J.*, 23 Dec. 1846, 35, 424-425.
109. MANSON, F. R. Administration of ether in midwifery practice. *Lancet*, 21 Aug. 1847, 2, 213.
110. *MARG-DUPUY. Note sur les effets de l'injection de l'éther dans le rectum. *C. R. Acad. Sci., Paris*, 5 April 1847, 24, 605-607.
111. MARCY, E. E. Inhalation of ether to prevent pain. *Boston med. surg. J.*, 21 July 1847, 36, 495-497.
112. MEDICAL MISSIONARY SOCIETY IN CHINA. *Report of the Medical Missionary Society in China; the 14th report of the Ophthalmic Hospital, Canton.* Embracing the period from 1st July 1845, to 31st December 1847. By Rev. P. Parker. Canton, Chinese repository, 1848. 23 pp. (Ether, pp.12-14.)
113. 'Medicus.' The pain-destroying agent. *Boston med. surg. J.*, 12 Apr. 1848, 38, 223-224.
114. *MENIÈRE, P. Lettre de M. M. sur l'action des vapeurs d'éther dans quelques cas de surdité. *Bull. Acad. Méd. Paris*, 19 Jan. 1847, 12, 274-278.
115. NELSON, HORACE. Experiments with the sulphuric ether vapor. *Boston med. surg. J.*, 16 June 1847, 36, 401-402. (See *Brit. Amer. J. med. phys. Sci.*, June 1847, 3, 34-36.)
116. *PAPPENHEIM, S. Recherches concernant la structure des nerfs qui ont perdu leurs fonctions sous l'influence de l'éther. *C. R. Acad. Sci., Paris*, 22 March 1847, 24, 496-497.
117. *PARCHAPPE. De l'action tonique de l'éther sulfurique. *C. R. Acad. Sci., Paris*, 10 May 1847, 24, 852-853.
118. PARKER, E. H. Ether and surgery in New Hampshire. *Boston med. surg. J.*, 13 Oct. 1847, 37, 218-219.
119. PARKMAN, Samuel. Inhalation of ethereal vapor—painless reduction of a dislocated shoulder joint under its influence. *Boston med. surg. J.*, 16 Dec. 1846, 35, 409-410.
120. PEIRSON, A. L. Surgical operations with the aid of the "new gas." *Boston med. surg. J.*, 2 Dec. 1846, 35, 363-365.
121. — Etherization. *Boston med. surg. J.*, 19 Jan. 1848, 37, 499-500.
122. 'A Physician.' Ethereal vapor. *Boston med. surg. J.*, 1 Feb. 1847, 35, 472-473.
123. *PIROGOFF, N. Nouveau procédé pour produire, au moyen de la vapeur d'éther, l'insensibilité chez les individus soumis à des opérations chirurgicales. *C. R. Acad. Sci., Paris*, 5 May and 21 June 1847, 24, 789; 1110.
124. — *Recherches pratiques et physiologiques sur l'éthérisation.* St. Pétersbourg, 1847. 109 pp., 1 fold. pl.
125. *PREISSER, PILLORE, and MELAYS. Expériences tendant à prouver que la cessation de l'hématose pulmonaire est la cause de l'insensibilité qui suit les inspirations d'éther en vapeur. *C. R. Acad. Sci., Paris*, 22 March 1847, 24, 490-491.
126. PRING, J. H. Observations and experiments on the direct action of ether on the blood. *Lancet*, 1 May 1847, 1, 457-458.
127. PUTNAM, C. G. On etherization in labor. *Boston med. surg. J.*, 26 Jan. 1848, 37, 516-519; 38, 9-11.
128. RADFORD, Thomas. A few remarks on the inhalation of ether during labour. *Lancet*, 10 April 1847, 1, 384-385.
129. RICHARDSON, B. W. *On local anesthesia by ether spray, as a means for the entire extinction of pain in operations on the inferior animals.* New York, Bergen & Tripp, 1868. 12 pp.
130. ROBINSON, James. On the inhalation of ether. *Lancet*, 13 Feb. 1847, 1, 168-169.
131. *ROUX. Communication relative aux effets de l'éther introduit par la respiration. *C. R. Acad. Sci., Paris*, 25 Jan. 1847, 24, 89-91.

132. — Sur les effets de l'éther. *Ibid.*, 1 Feb., 145-149.
133. — — With discussion by Magendie and Velpeau. *Ibid.*, 8 Feb., 168-179.
134. — Nouvelle communication sur l'emploi des vapeurs éthérées. *Ibid.*, 21 June, 1099-1101. See also VII. 40.
135. *SANSON, Alphonse. Sur les divers moyens de rendre les malades insensibles pendant les opérations chirurgicales. *Bull. Acad. Méd. Paris*, 19 Jan. 1847, 12, 273-274.
136. SCOTT, John. Etherization and asphyxia. *Lancet*, 3 April 1847, 1, 355.
137. *SÉDILLOT. Observations sur les effets de l'éthérisation chez cinquante malades soumis à des observations chirurgicales. *C. R. Acad. Sci., Paris*, 30 Aug. 1847, 25, 336-338.
138. SEMPLÉ, A. B. Rheumatic neuralgia of the head and face treated by the inhalation of ether. *Lancet*, 27 March 1847, 1, 332-333.
139. *SERRES. De l'action de l'éther liquide sur le tissu nerveux. *C. R. Acad. Sci., Paris*, 8 Feb. 1847, 24, 162-168.
140. — Deuxième note. . . *Ibid.*, 15 Feb. 1847, 227-229.
141. SHIPMAN, A. B. Reduction of a dislocation of the shoulder, twenty-two days after its occurrence, with the use of ether. *Boston med. surg. J.*, 12 July 1848, 38, 482-483.
142. *SIMPSON, J. Y. *Notes on the inhalation of sulphuric ether in the practice of midwifery*. Edinburgh, Sutherland & Knox, 1847. 11 pp. (Repr. fr. *Mon. J. med. Sci.*, March 1847.)
- 142a. * — On the employment of ether in the practice of midwifery. *Lond. med. Gaz.*, 19 March 1847, n.s.4, 523-524.
143. SMITH, Protheroe. On the employment of ether by inhalation in obstetric practice. *Lancet*, 1 May 1847, 1, 452-457.
144. SMITH, W. T. A lecture on the utility and safety of the inhalation of ether in obstetric practice. *Lancet*, 27 March 1847, 1, 321-323.
145. SNOW, John. A lecture on the inhalation of vapour of ether in surgical operations. *Lancet*, 29 May 1847, 1, 551-554.
146. STEDMAN, C. H. Dislocation reduced by the aid of the ethereal inhalation, with other notices. *Boston med. surg. J.*, 17 Feb. 1847, 36, 62-63.
147. UPHAM, J. B. Case of delirium tremens treated by inhalation of ether. *Boston med. surg. J.*, 28 July 1847, 36, 518-519.
148. *VELPEAU, A. Communication relative aux effets de l'éther introduit par la respiration. *C. R. Acad. Sci., Paris*, 25 Jan. 1847, 24, 91-94.
149. — Sur les effets de l'éther. [With discussion by Magendie.] *Ibid.*, 1 Feb., 129-144. See also VII. 40.
150. *VILLE and BLANDIN. Modifications de la respiration chez les personnes soumises à l'inhalation de l'éther. *C. R. Acad. Sci., Paris*, 7 June 1847, 24, 1016-1017.
151. WALLACE, W. C. Remarks on the inhalation of ether previous to surgical operations. *Boston med. surg. J.*, 23 Dec. 1846, 35, 435-436.
152. WARREN, Edward. The letheon and Dr. Wells. *Boston med. surg. J.*, 28 April 1847, 36, 260-263.
153. — Ethereal inhalation—Dr. Wells's claims as discoverer. *Ibid.*, 19 May 1847, 322-323.
154. — Dr. Jackson's review of Dr. Gay's statement, &c. *Ibid.*, 28 July 1847, 520-523.
155. WARREN, Edward, M.D. Note to editor. *Ibid.*, 21 July 1847, 506-507.
156. WARREN, J. C. *Etherization; with surgical remarks*. Boston, W. D. Ticknor & Co., 1848. v, 100 pp.
157. — Inhalation of ethereal vapor for the prevention of pain in surgical operations. *Boston med. surg. J.*, 9 Dec. 1846, 35, 375-379.

158. WARREN, J. M. Inhalation of ether. *Boston med. surg. J.*, 24 March 1847, 36, 149-162.

159. — [Boston, 1847.] 18 pp.

160. — *Lithotripsy and lithotomy, with the use of ether in those operations.* Boston, D. Clapp, 1849. 15 pp. (From *Amer. J. med. Sci.*)

161. *WRIGHT, Thomas. Cases illustrative of the value of ether inhalation in practical surgery. *Lancet*, 13 March 1847, 1, 280-281.

Chloroform

162. *AMUSSAT. Note concernant les effets de l'inhalation du chloroforme sur les animaux et sur l'homme. *C. R. Acad. Sci., Paris*, 29 Nov. 1847, 25, 804-806.

162a. BLACK, Patrick. *Chloroform: how shall we ensure safety in its administration?* London, J. Churchill, 1855. 40 pp.

163. *BLANCHET. Expériences faites sur les animaux, dans le but d'étudier les effets et le mode d'action du chloroforme;—nouvelle application de ce médicament à la pratique chirurgicale. *C. R. Acad. Sci., Paris*, 27 Dec. 1847, 25, 969-970.

164. BOSTON MEDICAL AND SURGICAL JOURNAL. Editorials. Vol. 37, Aug. 1847-Jan. 1848.

New anæsthetic agent: p. 463

Inhalation apparatus: p. 467

Chloroform: p. 468

Chloroform inhalers: p. 506

Amputation of breast under chloroform: p. 526.

165. — Vol. 38, Feb.-Aug. 1848

Manufacture of chloroform: p. 25

Chloroform inhalers: p. 65

Prof. Simpson's process of purifying chloroform: p. 86

Progress of the use of chloroform: pp. 143-144

Case of alleged death from chloroform inhalation: pp. 184-185

Chloroform inhalers: p. 186

Chloroform. By Daniel Harrington [review]: p. 311.

166. BROWN, Buckminster. Chloroform inhalation. *Boston med. surg. J.*, 29 Dec. 1847, 37, 446.

167. BROWN, I. B. On the use of chloroform in the practice of midwifery. *Lancet*, 4 Dec. 1847, 2, 604.

168. BUCHANAN, George. Chloroform in dentistry. *Lancet*, 27 Nov. 1847, 2, 585.

169. CHASSAIGNAC, E. P. M. *Recherches cliniques sur le chloroforme.* Paris, J.-B. Baillière, 1853. 2 ll., 43 pp.

170. *GERDY. Considérations sur les effets de l'inhalation du chloroforme. *C. R. Acad. Sci., Paris*, 29 Nov. 1847, 25, 803-804.

171. HANCORN, J. R. *Observations on chloroform in parturition. With cases.* London, Smith, Elder and Co., 1848. iv, 32 pp.

172. HARRIS, C. A. Chloroform—a substitute for ether. *Boston med. surg. J.*, 29 Dec. 1847, 37, 442.

173. *JOBERT. Emploi de l'inhalation du chloroforme pour produire l'insensibilité chez divers individus soumis à des opérations chirurgicales. *C. R. Acad. Sci., Paris*, 29 Nov. 1847, 25, 806-807.

174. KIRSTEN, T. F. *Nonnulla de chloroformio.* Leipzig, A. Edelmann [1858]. 16 pp.

175. THE LANCET. *Operations without pain.* 27 Nov. 1847, 2, 571-572.

176. MEDICAL MISSIONARY SOCIETY IN CHINA. *Minutes of the annual meeting . . . ; and fifteenth report of its Ophthalmic Hospital at Canton, for the years 1848 and 1849.* By Rev. P. Parker, M.D. Canton, Chinese Repository, 1850. 39 pp. (Chloroform, pp. 29-30.)

177. MURPHY, E. W. Administration of chloroform in cases of difficult parturition. *Lancet*, 18 Dec. 1847, 2, 653-654.

178. — *Chloroform; its properties and safety in childbirth.* London, Walton and Maberly, 1855. viii, 72 pp.

179. MUSSEY, R. D. Chloroform in surgical operations. *Boston med. surg. J.*, 5 April 1848, 38, 194-195.

180. — Chloroform. *Ibid.*, 26 July 1848, 520-521.

181. ROYAL MEDICAL AND CHIRURGICAL SOCIETY OF LONDON. *Report of the committee appointed . . . to inquire into the uses and the physiological, therapeutical, and toxical effects of chloroform, as well as into the best mode of administering it, and of obviating any ill consequences resulting from its administration.* London, J. E. Adlard, 1864. 1 p. l., 120 pp.

182. *ROUX. Communication verbale concernant les effets de l'inhalation du chloroforme sur des individus soumis à des opérations chirurgicales. *C. R. Acad. Sci., Paris*, 15 Dec. 1847, 25, 887-889.

183. SABIN, H. L. Administration of chloroform in convulsions of infants. *Boston med. surg. J.*, 5 April 1848, 38, 199.

184. *SÉDILLOT. Observations relatives à l'inhalation du chloroforme. *C. R. Acad. Sci., Paris*, 29 Nov. 1847, 25, 801-802.

185. SMILIE, E. R. Prof. Simpson's process of purifying chloroform. *Boston med. surg. J.*, 23 Feb. 1848, 38, 86-87.

186. SMITH, Protheroe. On the use of chloroform in midwifery practice. *Lancet*, 27 Nov. 1847, 2, 572-574.

187. *SOUBEIRAN. Préparation du chloroforme. *C. R. Acad. Sci., Paris*, 29 Nov. 1847, 25, 799-801.

188. *VELPEAU, A. Opinion sur l'emploi du chloroforme. *C. R. Acad. Sci., Paris*, 15 Dec. 1847, 25, 890-891.

Ether and Chloroform Compared

189. *AMUSSAT. Effets de l'inhalation de l'éther et du chloroforme sur l'apparence du sang artériel. *C. R. Acad.*

Sci., Paris, 27 Dec. 1847, 25, 967-969.

190. BARKER, Fordyce. On the use of anæsthetics in midwifery. *Trans. N. Y. Acad. Med.*, 1861, 2, 251-268.

191. BIGELOW, H. J. Anæsthetic agents, their mode of exhibition and physiological effects. *Trans. Amer. med. Ass.*, 1848, 1, 197-224. (Also reprinted separately, n.p., n.d., 18 pp.)

192. — *Ether and chloroform: a compendium of their history, surgical use, dangers, and discovery.* Boston, D. Clapp, 1848. 12 pp.

193. — — *Ibid.*, 27 pp.

194. — The use of ether and chloroform. *Boston med. surg. J.*, 1 March 1848, 38, 101-103.

195. BIGELOW, Jacob. Ether and chloroform—Boston and Edinburgh. Correspondence of Sir James Y. Simpson and Dr. Jacob Bigelow. *Boston med. surg. J.*, 10 March 1870, 82, 187-190.

196. BOSTON MEDICAL AND SURGICAL JOURNAL. *Editorial. Vol. 38, Feb.-July 1848*

Dr. Smilie's improved instrument for inhaling chloroform and ether: pp. 26-27

Use of ether vapor in operative surgery: p. 28

Ænanthic ether—effects of chloroform on the system: p. 46.

197. BOWDITCH, H. I. Etherization by chloroform. *Boston med. surg. J.*, 5 Jan. 1848, 37, 467.

198. *BOYER, L. Considérations sur l'emploi comparatif de l'éther et du chloroforme. *C. R. Acad. Sci., Paris*, 13 Dec. 1847, 25, 903-904.

199. CASTLE, A. C. Chloric-ether—chloroform? Its uses and abuses. *Boston med. surg. J.*, 12 April 1848, 38, 219-223.

200. FLAGG, J. F. Sulphuric ether and chloroform. *Boston med. surg. J.*, 12 Jan. 1848, 37, 521-522.

201. — *Ether and chloroform: their employment in surgery, dentistry, midwifery, therapeutics, etc.* Philadelphia, Lindsay and Blakiston, 1851. 189 pp.

202. *GIRARDIN, J., and VERRIER. Expériences faites sur les animaux avec le chloroforme et l'éther. *C. R. Acad. Sci., Paris*, 27 Dec. 1847, 25, 964-969.

203. *GRUBY. Effets du chloroforme sur les animaux, comparés à ceux de l'éther. *C. R. Acad. Sci., Paris*, 13 Dec. 1847, 25, 901-903.

204. MOTT, Valentine. *Pain and anesthetics: an essay, introductory to a series of surgical and medical monographs.* 2d ed. Washington, M'Gill & Witherow, 1863. 16 pp.

205. SPIEGEL. Philadelphia medical schools—chloroform and ether. *Boston med. surg. J.*, 16 Feb. 1848, 38, 60-63.

206. WARREN, J. C. *Effects of chloroform and of strong chloric ether, as narcotic agents.* Boston, W. D. Ticknor & Co., 1849. 66 pp.

VIII. EARLY GENERAL MONOGRAPHS ON SURGICAL ANESTHESIA

WITH the discovery of chloroform in 1847 and the introduction of nitrous oxide in 1863, the virtues of the several agents available for anesthesia were compared, and it soon became obvious that one anesthetic was better suited for a given type of operation than another. Physicians, nurses, and operating room attendants began to specialize in giving anesthesia; presently a new branch of medicine was born and monographs dealing with the new specialty began to appear. One of the earliest was that of Francis Anstie which, oddly enough, appeared in Philadelphia (1865), a community which had been one of the most resistant to the use of anesthesia when first introduced. Much more advanced, however, was the monograph of Laurence Turnbull, which also appeared in Philadelphia in 1878, and was quickly followed by a second edition in 1879. One of the most widely used and quoted of the early anesthesia monographs was that of Henry M. Lyman of Tufts Medical School in Boston, *Artificial anæsthesia and anæsthetics* (1881). After 1880 anesthesia manuals began to appear in great profusion in every country in the world.

1. ANSTIE, F. E. *Stimulants and narcotics, their mutual relations: with special researches on the action of alcohol, æther and chloroform on the vital organism*. Philadelphia, Lindsay and Blakiston, 1865. 414 pp.

2. BERNARD, Claude. *Leçons sur les anesthésiques et sur l'asphyxie*. Paris, J.-B. Baillière, 1875. vii, 536 pp.

3. *BOUISSON, E. F. *Traité théorique et pratique de la méthode anesthésique appliquée à la chirurgie et aux différentes branches de l'art de guérir*. Paris, J.-B. Baillière, 1850. 560 pp.

4. KAPPELER, OULO. *Anæsthetica*. Stuttgart, F. Enke, 1880. xiv, 219 pp.

5. LYMAN, H. M. *Artificial anæsthesia and anæsthetics*. New York, W. Wood, 1881. vii, 338 pp.

6. SQUIBB, E. R. *Anæsthetics*. New York, 1871. 30 pp.

7. TURNBULL, Laurence. *The advantages and accidents of artificial anæsthesia: a manual of anæsthetic agents, and their employment in the treatment of disease*. Philadelphia, Lindsay and Blakiston, 1878. viii, 13-210 pp.

8. ———. 2d ed., rev. and enl. Philadelphia, Lindsay and Blakiston, 1879. 322 pp.

IX. REGIONAL AND BLOCK ANESTHESIA

(To follow in Part II of this Catalogue)

X. OTHER ANESTHETICS (after 1875)

(To follow in Part II of this Catalogue)

XI. ANESTHESIA AND PSYCHIATRY

UNDER the arresting title of "The emergence of anesthesia's second power," Henry K. Beecher (p. 95) has described the little-known tract of William James' friend, Benjamin Paul Blood (1832-1919) entitled *The anæsthetic revelation and the gist of philosophy* (1874). Davy and Barton had recognized that nitrous oxide enabled them to probe levels of their own consciousness not ordinarily accessible. "I lost all connection with external things," Davy wrote, "trains of vivid images rapidly passed through my mind and even connected with words in such a manner as to produce perceptions perfectly novel." Blood, the eccentric young philosopher-poet of Amsterdam, New York, had a similar experience. "I affirm," he wrote, "that there is an invariable and reliable condition . . . ensuing about the instant of recall from anæsthetic stupor to sensible observation, or 'coming to,' in which the genius of being is revealed; but because it cannot be remembered in the normal condition it is lost altogether through the infrequency of anæsthetic treatment in any individual's case ordinarily, and buried, amid the hum of returning common sense, under that epitaph of all illuminations: 'this is a queer world!'" This, Beecher points out, is the basis of the procedure developed in World War II in treating war neuroses, for anesthetics have the "power to reveal, to control and to relieve hidden forces in the mind." By some, the use of anesthetics for the treatment of war neuroses has been designed "narcosynthesis," and since a large literature on this important application of anesthesia is developing with great rapidity, it seems appropriate to make it a major subdivision in a schedule for classifying the various contributions in the field of anesthesia. While this part of the catalogue does not carry the subject beyond 1875, Blood's tract appeared in 1874 and is therefore included since it stands as the forerunner of one of the great developments in anesthesiology—and it points the way for many future applications.

XI. 1.

BLOOD'S ANÆSTHETIC REVELATION *Amsterdam, N. Y., 1874.*

Title: The | anæsthetic revelation | and | the gist of philosophy.

| By | Benjamin Paul Blood. | [device] | Amsterdam, in New
York, America. | 1874.

Collation: 1 l., 37 pp., 2 ll.

Contents: [*]1a half-title; [*]1b blank; p.[1] title; p.[2] blank; pp.[3]-37 text; p.[38] blank; 2 blank ll.

Note: The first thirty-three pages deal with the author's rather obscure philosophical convictions. The 'anæsthetic revelation' is described on pp. 33-37. He begins: "By what follows I rather hope to signalize than purpose to define a discovery . . . which has been usual with me for now nearly fourteen years." He describes how his subconscious had emerged as he was recovering from the effects of anæsthetic inhalation and concludes:

'We are such stuff
As dreams are made on, and our little life
Is rounded with a sleep.'

[*The Tempest*, Act iv, Sc. 1]

William James was much struck by Blood's brochure and reviewed it at length in the *Atlantic Monthly* (1874, 34, 627). Thereafter James studied on himself and his students the effects of anesthesia on subconscious recall, and a long and illuminating correspondence followed with Blood. In a letter of 28 June 1876 James characterized Blood picturesquely: "I see you are a man of discontinuity and insight, and not a philosophic pack-horse"; and again (28 April 1897), "Your thought is obscure—lightning flashes, darting gleams—but that's the way truth is." Two months before James died he published a review of Blood's philosophy in the *Hibbert Journal* (July 1910) and just before the review appeared, Blood received this warning (25 June 1910):* "Tired of waiting for your final synthetic pronouncement, and fearing I might be cut off ere it came, I took time by the forelock, and . . . I resolved to save at any rate some of your rhetoric, and the result is what you see. Forgive! forgive! forgive!" James died on 26 August 1910 and Blood on 15 January 1919 in his eighty-seventh year (*Dictionary of American Biography*).

Copy: CtY.

* *The Letters of William James*. Edited by his son Henry James. London, Longmans, Green, and Co., 1920. (Vol. 2, p. 348.)

XII. HISTORY AND BIBLIOGRAPHY OF SURGICAL ANESTHESIA

A DEFINITIVE history of anesthesia with all of its many angles, its confusion and all the acrimonious debate behind the thrilling achievement has yet to be written. There is no paucity of source material, but much of it lies unread and without full analysis. It is hoped that the arrangement and classification of the diverse materials offered in this catalogue may prove a useful tool for some future historian. While none of the histories that have so far appeared is complete, all, or nearly all, are valuable for one or more phases of the subject. Fülöp-Miller is good reading and can be recommended to those who prefer romance to history and who are not seeking precise factual statement. The five histories that have appeared in 1945-1946 are more complete than any of the earlier chronologies: Raper is useful especially for its critical bibliography, and Keys for its long lists of modern references; Ellis is filled with erudite and well-documented information on the early potions; Bankoff gives a reliable if somewhat overdramatized account of the story, well adapted for the lay reader; and Robinson's text, which is pitched for the 'teen-aged high school and college student, appears to us the best balanced and the most accurate and readable of the group. There are also many papers dealing with special phases of the subject and many brief, general résumés. These have been grouped first and the more detailed histories follow.

No account of the historical sources of anesthesia would be complete without reference to the *Bibliotheca Osleriana*. Shortly before his death Sir William Osler had collected the early anesthesia papers with great zeal, but he did not have time to arrange his various holdings. Dr. W. W. Francis, his literary executor, annotated Osler's catalogue and devoted particular attention to the anesthesia pamphlets, with the result that there is no more complete modern source of information concerning the history of anesthesia.

Accounts of the spread of surgical anesthesia to other countries, especially to Scandinavia, Southern Europe, Russia, and China will be found in the anesthesia number (October 1946) of the *Journal of the History of Medicine and Allied Sciences* and in the *British Medical Bulletin* (see p. 98).

Journal Articles

1. ARCHER, W. H. The discovery of anesthesia: analysis of the contributions of Davy, Faraday, Hickman, Long, Wells, Morton and Jackson. *Anesth. & Analges.*, 1942, 21, 96-100.
2. — Historical sketch of anesthesia. *Anesth. & Analges.*, 1944, 23, 229-247; 1945, 24, 15-37.
3. — The history of anesthesia. *Proceedings of the Dental centenary celebration*, March 1940, 333-363.
4. ASHHURST, John. Surgery before the days of anæsthesia. See XII. 54, pp. 25-27.
5. BARRETT, N. R. A tribute to John Snow, M.D. London 1813-1858. *Bull. Hist. Med.*, 1946, 19, 517-535.
6. BEECHER, H. K. The emergence of anesthesia's second power. Read at Ether Centennial Celebration, Massachusetts General Hospital, 16 October 1946. (To be published.)
7. — The first anesthesia records (Codman, Cushing). *Surg. Gynec. Obstet.*, 1940, 71, 689-693.
8. BIGELOW, H. J. A history of the discovery of modern anæsthesia. *Amer. J. med. Sci.*, 1876, 141, 164-184.
9. BUXTON, D. W. John Snow and the advent of chloroform. *Brit. J. Anæsth.*, 1924, 1, 101-107.
10. — An oration on empiricism or science?—Anæsthetics, 1847-1897. *Lancet*, 1897, 2, 1369-1376.
11. — Snow's work on chloroform. *Brit. J. Anæsth.*, 1924, 1, no. 4, 8 pp.
12. CAPPARONI, Pietro. Ancora una parola sulla scoperta dell'anestesia generale coll'etere solforico. *Atti Accad. Stor. Arte sanit.*, May-June, 1937, 36, 12 pp.
13. CHEEVER, D. W. What has anæsthesia done for surgery. See XII. 54, pp. 39-48.
14. CLENDENING, Logan. Literature and material on anæsthesia in the library of medical history of the University of Kansas Medical Department, Kansas City, Kansas. *Bull. med. Libr. Ass.*, 1945, 33, 123-138.
15. COCK, F. W. The first operation under ether in Europe—the story of three days. *Univ. Coll. Hosp. Mag.*, 1911, 1, 127-144.
16. DAVIS, R. T. Reminiscences of 1846. See XII. 54, pp. 17-23.
17. FORD, W. W. Ether inhalers in early use. *New Engl. J. Med.*, 1946, 234, 713-726.
18. HOFF, H. E. Ether versus chloroform. *New Engl. J. Med.*, 1937, 217, 579-592.
19. HUNT, J. H. Who discovered anæsthesia? *Tri-St. med. J. Practit.*, St. Louis, 1897, 4, 38, 79.
20. KEYS, T. E. The development of anesthesia. *Anesthesiology*, 1941, 2, 552-574; 1942, 3, 11-23, 282-294, 650-658; 1943, 4, 409-429.
21. LEAKE, C. D. The historical development of surgical anesthesia. *Sci. Mon.*, N. Y., 1925, 20, 304-328.
22. — Valerius Cordus and the discovery of ether. *Isis*, 1925, 7, 14-24.
23. MCBURNEY, Charles. The sur-

gery of the future. See XII. 54, pp. 69-76.

24. MAGRUDER, E. M. Discovery of surgical anaesthesia. *Virginia med. (Semi-) Mon.*, 1915, 41, 554-559. 577-582, 608-614; 42, 12-16.

25. MILLER, A. H. The origin of the word "anaesthesia." *Bost. med. surg. J.*, 1927, 197, 1218-1222.

26. OSLER, Sir William. The first printed documents relating to modern surgical anaesthesia. *Proc. R. Soc. Med.*, 1918, 11, 65-69. Also *Ann. med. Hist.*, 1910, 1, 329-332.

27. PARKER, George. The discovery of the anæsthetic powers of nitrous oxide. *Lancet*, 1928, 1, 60-62.

28. REYNOLDS, J. P. Relation of anaesthesia and obstetrics. See XII. 54, pp. 49-56.

29. SIGERIST, H. E. A collection of nineteenth-century autographs, being a contribution to the history of anaesthesia. *Bull. Inst. Hist. Med.*, 1933, 1, 107-117.

30. TALLMADGE, G. K. The third part of the De extractione of Valerius Cordus. *Isis*, 1925, 7, 394-411.

31. THOMS, Herbert. "Anesthésie à le reine." *Amer. J. Obstet. Gynaec.*, 1940, 40, 340-346.

32. WELCH, W. H. The influence of anaesthesia upon medical science. See XII. 54, pp. 57-68.

Monographs and Addresses

33. BANKOFF, George. *The conquest of pain; the story of anaesthesia*. London, Macdonald & co. [1946]. 204 pp.

34. BAUR, M. L. *Recherches sur l'histoire de l'anesthésie avant 1846*. Leiden, E. J. Brill, 1927. 89 pp.

35. BURROUGHS, WELLCOME & Co., LONDON. *Anæsthetics, antient & modern; an historical sketch of anæsthesia*. London, Burroughs Wellcome & co. [n.d.] 80 pp.

36. — — — *Lecture memoranda, American Medical Association, Atlantic City, N. J., 1907*. London, Burroughs Wellcome & co. [1907] 176 pp.

37. CABOT, R. C. *The achievements, standards and prospects of the Massachusetts General Hospital*. [Boston, 1919] 22 pp.

38. CAMAC, C. N. B., comp. *Epoch-making contributions to medicine, surgery and the allied sciences*. Philadelphia, W. B. Saunders company, 1909. (Anesthesia, pp. 313-332.)

39. CLENDENING, Logan, ed. *Source book of medical history*. New York, P. B. Hoeber, 1942. (Anesthesia, pp. 366-372.)

40. COLLIER, F. A. The hospital and American medicine. From *Massachu-*

setts General Hospital, Boston. Dedication exercises . . . Ether Day, 16 October 1939. Boston [1939] pp. 7-16.

41. CRILE, G. W. *Phylogenetic association in relation to certain medical problems*. [Boston, The Barta press, 1910] 41 pp.

42. CUSHING, HARVEY. *The personality of a hospital*. [Hallowell, Maine, White & Horne company, 1930] 40 pp. Also *Boston med. surg. J.*, 1921, 185, 529-538.

43. ELIOT, C. W. *The fruits of medical research with the aid of anaesthesia and asepticism*. [Boston, The Barta press] 1909. 19 pp.

44. ELLIS, E. S. *Ancient anodynes; primitive anaesthesia and allied conditions*. London, W. Heinemann, 1946. 187 pp.

45. EMERSON, Haven. *Preparedness for health*. [Boston, Jamaica printing company, 1916] 29 pp.

ETHER DAY ADDRESSES, Massachusetts General Hospital, Boston. [No addresses given in the years not mentioned.]

1908 Welch, W. H. *A consideration of the introduction of surgical anaesthesia*.

- 1909 Eliot, C. W. *The fruits of medical research with the aid of anæsthesia and asepticism.*
- 1910 Crile, G. W. *Phylogenetic association in relation to certain medical problems.*
- 1911 Flexner, Simon. *The biological basis of specific therapy.*
- 1912 Mayo, W. J. *Contributions of the nineteenth century to a living pathology.*
- 1913 Rosenau, M. J. *Progress and problems in preventive medicine.*
- 1914 Finney, J. M. T. *The significance and effect of pain.*
- 1915 Keen, W. W. *The dangers of ether as an anesthetic.*
- 1916 Emerson, Haven. *Preparedness for health.*
- 1919 Cabot, R. C. *The achievements, standards and prospects of the Massachusetts General Hospital.*
- 1920 Three letters read from Dr. Cock on Ether Day Bell.
- 1921 *Shattuck, F. C. *The physicians of the first century.*
Cushing Harvey. *The personality of a hospital.*
*Campbell, C. M. *History of insanity during the past century with special reference to the McLean Hospital.*
*Ireland, M. W. *The place of the civil general hospital in the scheme of medical preparedness.*
1923. Training School anniversary—Addresses by Drs. W. H. Smith and R. C. Cabot.
- 1924 Zinsser, Hans. *Medicine and the community.*
- 1925 *Gibbon, J. H. . *The influence of the Boston profession on American medicine.*
- 1928 *Lusk, Graham. *On diabetes.*
- 1933 *Miner, L. M. S. *Dentists' achievement in the discovery and development of anæsthesia.*
- 1934 *Washburn, F. A. *Hospitals then and now.*
- 1936 *White, P. D. [No formal address published.]
- 1938 *Stewart, J. D. *Changes in sterilization and operating room procedures.*
- 1939 Collier, F. A. *The hospital and American medicine.*
46. FINNEY, J. M. T. *The significance and effect of pain.* [Boston, Griffith-Stillings press] 1914. 27 pp.
47. FLEXNER, J. T. *Doctors on horseback; pioneers of American medicine.* New York, The Viking press, 1937. xiv, 370 pp. (Crawford W. Long, William T. G. Morton, pp. 291-352.)
48. FLEXNER, Simon. *The biological basis of specific therapy.* [Boston, The Barta press] 1911. 20 pp.
49. FÜLÖP-MILLER, René. *Triumph over pain.* Indianapolis, The Bobbs-Merrill company [c1938] xii, 438 pp.
50. HODGES, R. M. *A narrative of events connected with the introduction of sulphuric ether into surgical use.* Boston, Little, Brown and company, 1891. 159 pp.
51. THE HOOSIER BOOKSHOP, INDIANAPOLIS. *Anæsthesia; discovery, controversy and early uses.* Indianapolis, Ind. [1935] 20 pp.
52. KEEN, W. W. *The dangers of ether as an anesthetic.* [Boston, Jamaica printing company, 1915] 29 pp.
53. KEYS, T. E. *The history of surgical anæsthesia.* New York, Schuman's, 1945. xxx, 191 pp.
54. MASSACHUSETTS GENERAL HOSPITAL, BOSTON. *The semi-centennial of anæsthesia, October 16, 1846-October 16, 1896.* Boston, Massachusetts General Hospital, 1897. 95 pp.
55. MAYO, W. J. *Contributions of the nineteenth century to a living pathology.* [Boston, The Barta press] 1912. 15 pp.
56. MITCHELL, S. W. *The birth and death of pain; a poem read October*

sixteenth, MDCCCXCVI, at the commemoration of the fiftieth anniversary of the first public demonstration of surgical anæsthesia. [New York, Vreeland advertising press, 1896?] 6 pp. Also in XII. 54, pp. 77-82.

57. OSLER, Sir William. *Bibliotheca Osleriana; a catalogue of books illustrating the history of medicine and science*. Oxford, At the Clarendon press, 1929. xxxv, 785 pp. (*In Bibliotheca prima, Anæsthesia*, pp. 135-151.)

58. RAPER, H. R. *Man against pain; the epic of anesthesia*. New York, Prentice-Hall, inc., 1945. viii, 24, ix+337 pp.

59. ROBINSON, Victor. *Victory over pain; a history of anesthesia*. New York, H. Schuman [1946] 334+ pp. (Incomplete page proofs.)

60. ROSENAU, M. J. *Progress and*

problems in preventive medicine. [Boston, Jamaica printing company, 1913] 32 pp.

61. SMILIE, E. R. *On the history of the original application of anæsthetic agents*. Boston, Stacy, Richardson & co., 1848. 23 pp.

62. THOMPSON, C. J. S. *The mystic mandrake*. London, Rider & co. [1934] 253 pp.

63. WARREN, J. C. *The influence of anæsthesia on the surgery of the nineteenth century*. Boston, Privately printed [Merrymount press] 1906. 30 pp.

64. WELCH, W. H. *A consideration of the introduction of surgical anæsthesia*. [Boston, The Barta press, 1908] 24 pp.

65. ZINSSER, Hans. *Medicine and the community*. [Boston, 1924] 32 pp.

Addendum

66. JOURNAL OF THE HISTORY OF MEDICINE AND ALLIED SCIENCES, NEW YORK. *Vol. 1, no. 4, October 1946*. (Anesthesia centennial number)

Surgical anesthesia, 1846-1946, by J. C. Trent

Some anesthetics of antiquity, by G. K. Tallmadge

Episodes in the history of anesthesia, by E. F. Horine

Mesmerism and surgery: a strange chapter in the history of anesthesia, by George Rosen

John Snow, M.D., anesthetist, by T. E. Keys

The history of anesthesia and analgesia in obstetrics, by C. E. Heaton

Historical notes on the pharmacology of anesthesia, by C. D. Leake

The evolution of endotracheal anesthesia, by N. A. Gillespie

The development of anesthesiology in

the United States: personal observations 1913-1946, by R. M. Waters
The introduction of surgical anesthesia in France, by Raymond Neveu
The reception of ether anesthesia by a French cartoonist, by R. L. Mayer
The introduction of general anesthesia in Germany, by W. K. Frankel
Development of anesthesia in Germany in the early years of the twentieth century, by R. J. Whitacre and A. P. Dumitru
The introduction of surgical anesthesia in Sweden, by G. Liljestränd
Surgical anesthesia in Spain, by Eduardo Garcia del Real

The introduction of sulphuric ether and its substitutes in Portugal, by Augusto da Silva Carvalho.

67. BRITISH MEDICAL BULLETIN, London. *Vol. 4, no. 2, 1946*. (Centenary of Anæsthesia)

INDEX

- Abbot, J. H., xiv, 71
 Académie des Sciences,
 Paris, 32, 55-58, 66-67,
 69
 Académie Royale de
 Médecine, 32
 Allan, Robert, 80
 Allen, J. A., 80
 American Academy of
 Arts and Sciences, 55,
 68
 American Dental Asso-
 ciation, 34
 Amussat, 80, 82, 87-88
 Anstie, F. E., 90
 Apuleius, vi, 3
 Arago, Dr., 55, 58
 Archer, W. H., 29-30, 34,
 95
 Ashhurst, John, 95
 Avicenna, 7

 B., T. E., 80
 Baker, Rachel, xiii, 63
 Balard, 83
 Ballantyne, J. W., 78
 Ballard, Edward, 80
 Bankoff, George, xiii-xiv
 Bannister, C., 80
 Barber, William, 71
 Barbour, A. H. F., 78
 Barker, Fordyce, 88
 Barnes, Robert, 78
 Barrett, N. R., 95
 Barton, W. P. C., xv, 11,
 92
 Baudens, 80
 Baur, Marguerite L., 3
 Beale, S. T., 80
 Beaumont, Élie de, 32,
 66-67
 Beaumont, William, 55
 Beddoes, Thomas, 8-11,
 24
 Beecher, H. K., 92, 95
 Bemis, J. W., 80
 Bennet, Henry, 82
 Bernard, Claude, 90
 Besseron, 80

 Bigelow, H. J., v, vii, xv,
 30, 36-39, 53, 64, 80, 88,
 95
 Bigelow, Jacob, 38, 52-
 53, 69, 80, 88
 Black, Patrick, 87
 Blanchet, 87
 Blandin, 82, 86
 Blood, B. P., 92-93
 Boccaccio, vi
 Boland, F. K., 27-28
 Boott, Francis, 38
 Boston. Committee of
 citizens, 64
 Boston Atlas, 32
 Boston Daily Advertiser,
 37, 39, 48, 55, 68
 Boston Daily Journal, 36
 Boston Evening Tran-
 script, 40, 42
 Boston Medical and Sur-
 gical Journal, vii, 30,
 36, 40, 42-44, 47, 50,
 52, 60, 79-81, 87
 Boston Post, 36
 Boston Society for Medi-
 cal Improvement, 36,
 81
 Bouisson, E. F., 90
 Boullay, 82
 Bourget, 81
 Boutigny, P., 81
 Bouvier, 81-82
 Bowditch, H. I., 88
 Bowditch, N. I., 42, 58,
 64
 Boyer, L., 88
 Boyle, Robert, 21-22
 Braid, James, 16, 19-20
 Bramwell, J. M., 19
 Brewster, C. S., 34
 Brown, Buckminster, 81,
 87
 Brown, I. B., 87
 Bryant, Henry, 81
 Buchanan, George, 87
 Bullein, William, 4-5
 Bulletin de l'Académie
 Royale de Médecine,
 Paris, 82

 Burroughs, Wellcome &
 Co., London, 96
 Buxton, D. W., 14, 27-28,
 95

 Cabot, R. C., 96
 Camac, C. N. B., 54
 Campbell, C. M., 97
 Capparoni, Pietro, 95
 Cardan, J., 82
 Castle, A. C., 88
 Chailly-Honoré, 82
 Chambers, Richard, 82
 Chambert, Henri, 82
 Channing, Walter, 82
 Chassignac, E. P. M., 87
 Cheever, D. W., 95
 Chevallier, 82
 Chiles, R. P., 28
 Cincinnati Gazette, 63
 Clark, Jonathan, 82
 Clarke, W. E., xiii, 25
 Claudian, 82
 Clendening, Logan, 37,
 54, 95
 Cloquet, 82
 Clough, John, 79
 Cock, F. W., 38, 95
 Codman, E. A., 95
 Coleridge, S. T., 10-11
 Coller, F. A., 96
 Collyer, R. H., 81
 Colton, G. Q., 29-30, 34
 Comrie, J. D., 14, 78
 Comstock, W. W., 82
 Connecticut State Medi-
 cal Journal, 34
 Cooley, Sam, 29
 Coote, H., 82
 Cordus, Euricius, 20
 Cordus, Valerius, 20-21
 Coudenberg, Peter, 21
 Cox, A. L., 82
 Crile, G. W., 96
 Croom, Sir Halliday, 78
 Cushing, Harvey, 95

 Dalton, John, 22, 24
 Dana, Fras. Jr., 80

- Dana, R. H. Jr., 56, 58, 68
 Darwin, Francis, vii
 Dauriol, 4, 79
 Davis, R. T., 95
 Davy, Sir Humphry, vi, xv, 8, 10-11, 24, 67, 69, 79, 92, 95
 Dawson of Penn, Lord, 12*n*
 Deane, James, 82
 Deschamps, 82
 Despretz, 83
 Dioscorides, vi, 3-6, 20
 Dorveaux, Paul, 5
 Doyère, 82
 Dubois, Paul, 82-83
 Dudley, Thomas, 83
 Dufay, 83
 Dumas, 72
 Dumitru, A. P., 72-73
 Duncan, Matthews, 72
 Duns, John, 78
 Durand, 80
 Dusinger, A. B., 64
 Dwinelle, W. H., 64
- Edinburgh Medical Journal, 78
 Edinburgh. Theatre Royal, 78
 Edmands, J. W., 58
 Eliot, C. W., 96, 97
 Elliotson, John, vi, 5, 15-17, 19
 Ellis, E. S., xiii-xiv, 3, 7, 18, 94
 Ellsworth, P. W., 79, 82-83
 Emerson, E. W., 71
 Emerson, Haven, 96-97
 Erving, H. W., 34
 Esdaile, James, vi, 15, 18-19
 Ether Day Addresses, 96
 Evans, Alexander, 71
 Everett, Edward, 52, 68-69
- Fairbrother, Alex., 83
 Faraday, Michael, xv, 24, 95
 Ferrus, 82
- Finney, J. M. T., 97
 Fisher, F. W., 83
 Fitz, Reginald, 36
 Flagg, J. F., 83, 88
 Flexner, J. T., xiii
 Flexner, Simon, 97
 Flourens, 62, 83
 Ford, W. W., 95
 Francis, W. W., 76, 94
 Frankel, W. K., 98
 Frobenius, J. A. S., 21, 22*n*
 Frost, Eben, 55
 Fry, C. C., 20
 Fülöp-Miller, René, 94
 Fulton, J. F., 28, 34, 58, 64, 71
- Galton, Francis, 6
 Garcia del Real, Eduardo, 98
 Gardner, J., 83
 Garrison, F. H., 19-20
 Gay, Martin, 71, 81-82, 86
 Gerdy, 82-83, 87
 Gesner, Conrad, 20
 Gibbon, J. H., 97
 Gibson, W., 83
 Gillespie, N. A., 98
 Girardin, J., 89
 Girdner, J. H., 78
 Godfrey, Ambrose, 21*n*-22*n*
 Godyer, John, 5
 Gordon, H. L., 72, 74, 77-78
 Gore, H. J., 83
 Goss, I. H., 28
 Gruby, 83, 89
 Gruner, O. C., 7*n*
 Gunther, R. T., 5
- H., A. S., 83
 Hale, Sarah J., 64
 Hales, Stephen, 8
 Hall, C. R., 80
 Hanckewitz, A. G., 21*n*-22*n*
 Hancorn, J. R., 87
 Harrington, Daniel, 87
 Harris, C. A., 60, 87
 Hart, D. B., 78
- Hartford Courant, 30-31, 38
 Harvey, William, 17
 Hayden, G. G., 50
 Hayden, W. R., 64
 Hayward, George, 36, 42, 44, 83
 Hearne, Edwin, 83
 Heaton, C. E., 98
 Henrion, Eugène, 56
 Heywood, C. F., 42, 44
 Hickman, H. H., vi, xv, 12-14, 32, 95
 Hoa-tho, vi, 4
 Hodges, R. M., 27
 Hoff, H. E., 95
 Holland, Philemon, 3, 5
 Holmes, O. W., 5, 50-52
 Honoré, 82, 84
 Hoosier Bookshop, Indianapolis, 97
 Horine, E. F., 98
 Hosack, A. E., 75, 84
 Hossard, 84
 Hudson, W., 51
 Hunt, J. H., 95
 Hunter, John, 7
 Hutin, 81
- Ireland, M. W., 97
- Jackson, C. T., xiii-xv, 24, 32, 34-35, 38-39, 47-48, 50-51, 54-55, 66-71, 81-82, 86, 95
 Jackson, J. B. S., 71
 Jacobs, Joseph, 28
 Jacobs, W. H., 35
 James, Henry, 93
 James, William, 92-93
 Jenner, Edward, 17
 Jobert, 82, 87
 Joly, 84
- Kappeler, Otto, 90
 Keen, W. W., 97
 Keep, N. C., 84
 Keith, George, 72-73
 Keller, C. N., 46
 Kendall, Amos, 71
 Keys, T. E., v, xiii, 94
 Kimball, Horace, 84
 Kirsten, T. F., 87

- Knight, Jonathan, 62
 Knopf, S. A., 64
 Kopp, 22*n*

 Lallemant, 82, 84
 Lancet, 38-39, 53, 74, 79, 84, 87
 Landouzy, H., 84
 Lansdown, J. C., 84
 Lassaigue, 84
 Laugier, 82, 84
 Leake, C. D., 14, 21
 Leavitt, W. P., 50
 Lemaitre, 84
 Liebig, 72
 Liljestrang, G., 98
 Liston, Robert, 38-39, 83
 Littell's Living Age, 56, 58
 London Medical Gazette, 39
 Long, C. W., v-vi, xiii, xv, 25-28, 95
 Lord, H. C., 71
 Lord, J. L., 71
 Loysel, 80
 Lüer, 84
 Lusk, Graham, 97
 Lyman, H. M., 25, 90

 McBurney, Charles 95
 McCrillis, H. O., 36, 64
 McLachlan, H., 22
 McMechan, F. H., 64
 Magendic, François, 83, 86
 Magruder, E. M., 96
 Maissiat, 84
 Malgaigne, J. F., 67, 82, 84
 Malle, 84
 Mandl, 84
 Mansfield, J. D., 85
 Manson, F. R., 85
 Marc-Dupuy, 85
 Marcy, E. E., 79, 82, 85
 Marcy, H. O., 63
 Massachusetts General Hospital, Boston, vi-vii, 36, 53-56, 58, 64, 67
 Mayer, R. L., 98
 Mayo, W. J., 97

 Medical Missionary Society in China, 85, 87
 Melays, 85
 Mellen, G. W. F., 79
 Menière, P., 85
 Merrill, G. P., 71
 Mesmer, F. A., 15
 Miller, A. H., 96
 Miner, L. M. S., 97
 Mitchell, S. W., 97
 Montagna, Mazzeo, vi
 Moore, James, 7
 Morse, S. F. B., 55
 Morton, Elizabeth W., 64
 Morton, W. J., vii, 63-64
 Morton, W. T. G., v-viii, xiii-xv, 14, 24-27, 29, 32, 34-68, 70-72, 81, 95
 Mott, Valentine, 75, 89
 Murphy, E. W., 87
 Mussey, R. D., 88

 Nelson, Horace, 85
 Neveu, Raymond, 98
 Newton, Sir Isaac, 21-22
 Nicolas of Salerno, 4-5

 Orfile, 82
 Osler, Sir William, vi, xiii, 6, 94
 Osler catalogue, 3, 5, 19, 74, 76, 94
 Oudet, 82
 Owen, vii

 Pappenheim, S., 85
 Parchappe, 85
 Parker, E. H., 85
 Parker, George, 96
 Parker, Peter, 85, 87
 Parker, Willard, 75
 Parkman, Samuel, 85
 Peabody, J., 66
 Pearson, Richard, 9-10
 Peirce, J. H., 51
 Peirson, A. L., 85
 Pennsylvania. University, 28
 Piorry, 82
 Pirogoff, N., 85
 Pliny, vi, 3-5
 Poore, B. P., 64
 Pope, Elijah, xiii, 25

 Preisser, Pillore, 85
 Priestley, Joseph, 8, 21-22
 Pring, J. H., 85
 Putnam, C. G., 85
 Puysegur, Maxime, 15

 Quistorp, J. B., 5-6

 Radford, Thomas, 85
 Raper, H. R., xiii, 28, 58, 63, 70, 94
 Renault, 82
 Reynolds, J. P., 96
 Rice, N. P., 44-45, 47, 65
 Richardson, B. W., 85
 Riggs, J. M., 29
 Robinson, James, 85
 Robinson, Victor, xiii, 94
 Rochoux, 82
 Roget, P. M., 10
 Rosen, George, 98
 Roseneau, M. J., 97, 98
 Roth, G. B., 65
 Roux, 66, 82-83, 85, 88
 Royal Medical and Chirurgical Society of London, 88
 Rush, Benjamin, 11

 Sabin, H. L., 88
 St. Martin, Alexis, 55
 Sanson, Alphonse, 86
 Schönbein, 55
 Scott, John, 86
 Sédillot, 86, 88
 Semple, A. B., 86
 Serres, 66, 84, 86
 Severinus, M. A., 7
 Shattuck, F. C., 97
 Shipman, A. B., 86
 Sigerist, H. E., 96
 Silva Carvalho, Augusto da, 98
 Simpson, Sir A. R., 78
 Simpson, E. B., 78
 Simpson, J. Y., xv, 60, 72-78, 86, 88
 Sims, J. Marion, 28
 Slade, D. D., 65
 Smilie, E. R., 60, 79, 88
 Smith, J. H., 30
 Smith, Protheroe, 86, 88

- Smith, Truman, 29, 35
 Smith, W. H., 97
 Smith, W. T., 86
 Snell, E. L., 65
 Snow, John, 86, 95
 Soifer, M. E., 29, 35
 Soubeiran, 72, 88
 Southey, Robert, 10-11
 Spear, T. R., 50
 Spiegel, 89
 Squibb, E. R., 90
 Stanley, Edward, 71
 Stearns, H. P., 35
 Stedman, C. H., 86
 Steiner, W. R., 29, 35
 Stewart, J. D., 97

 Tallmadge, G. K., 20-21
 Tavernier, 81
 Taylor, Frances L., 28
 Taylor, T., 82
 Tenney, Albert, 36
 Thompson, C. J. S., 3*n*, 98
 Thoms, Herbert, 96
 Thomson, James, 10
 Toucey, Isaac, 35
 Trent, J. C., 98
 Turnbull, Laurence, 90
 Turner, Matthew, 21-24

 Underwood, E. Ashworth, 14
 U. S. Patent Office, 47
 U. S. 30th Congress. 2d session. House, 65
 U. S. 32d Congress. 1st session. House, 65
 U. S. 32d Congress. 2d session. Senate, 65
 U. S. 37th Congress. 3d session. Senate, 65
 U. S. 69th Congress. 1st session, 1925-26, 28
 Upham, J. B., 86

 Velpeau, A., 66-67, 82, 86, 88
 Venable, James, 26
 Verrier, 89
 Viets, H. R., 47*n*, 65
 Ville, 86

 Wallace, W. C., 86
 Warren, Edward, M.D., xiv, 47-48, 65, 86
 Warren, Edward, 47-50, 52, 55, 65, 67-68, 86
 Warren, J. C., vii-viii, 29, 32, 36, 42, 44-45, 47, 68-69, 86, 89

 Warren, J. M., 40, 42, 47, 50, 87
 Washburn, F. A., 97
 Waters, R. M., 14
 Watt, James, 8-9
 Webster, Daniel, 46
 Wedgwood, Tom, 10
 Welch, W. H., xiii, 27
 Wellcome Historical Medical Museum, 12, 14, 32
 Wells, C. J., 35
 Wells, C. T., 35
 Wells, E. A., 35
 Wells, Horace, v-vi, xiii, xv, 12, 14, 25, 29-35, 48, 50-51, 70, 82-83, 95
 Wheatland, Henry, 42
 Whitacre, R. J., 98
 White, P. D., 97
 Whitman, Francis, 50, 59
 Worcester Bank & Trust Company, 65
 Wotton, 22*n*
 Wright, Thomas, 87
 Wright, William, 14-15

 Young, H. H., 27-28

 Ziegler, G. J., 79
 Zinsser, Hans, 98

Accession no.

8188

Author

Fulton, J.F.

Centennial of
surgical anesthesia

Call no.

Archives

Y386

A195

